

~~L. 193.~~

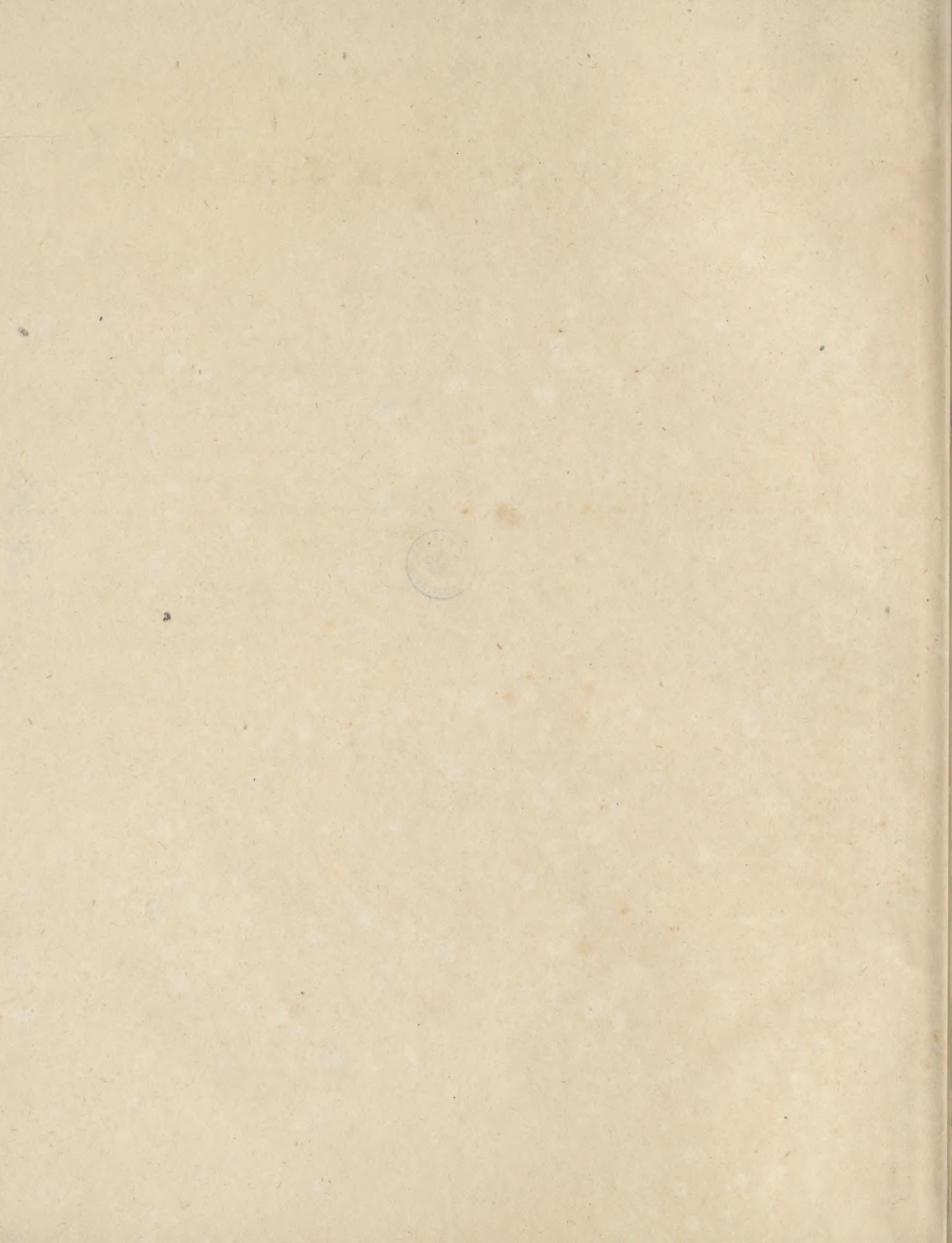
~~* 206.e.~~

B
L. 2

EB.9

Encyclopaedia Britannica





ENCYCLOPÆDIA BRITANNICA.

E L E

ELECTRICITY, MEDICAL. See MATERIA MEDICA.

ELECTRIDES, anciently islands in the Adriatic sea, which received their name from the quantity of amber (*electrum*) which they produced. They were at the mouth of the Po, according to Apollonius of Rhodes; but some historians doubt of their existence.

ELECTROMETER. In various parts of the article **ELECTRICITY**, we have described a great variety of instruments for ascertaining the presence of electricity, and measuring its quantity or proportion.

But there are several instruments of this kind that have not been described in that article; and as they are well deserving a place in this work, either from the ingenuity of their construction, the reputation of their inventors, or the intrinsic value of the instruments themselves, we shall give an account of them here.

Fig. 1. Plate CC. is a geometrical representation of Mr Cavallo's improved atmospherical electrometer, of half its real size. The principal part of this instrument is a glass tube CDMN, cemented at the bottom into the wooden piece AB, by which part the instrument is to be held when used for the atmosphere; and it also serves to screw the instrument into its wooden case ABO, fig. 2. when it is not to be used. The upper part of the tube CDMN, is shaped tapering to a smaller extremity, which is entirely covered with sealing-wax, melted by heat, and not dissolved in spirits. Into this tapering part a small tube is cemented, the lower extremity G of which being also covered with sealing wax, projects a short way within the tube CDMN. Into this smaller tube a wire is cemented, which with its lower extremity touches the flat piece of ivory H, fastened to the tube by means of cork; the upper extremity of the wire projects about a quarter of an inch above the tube, and screws into the brass cap EF, which cap is open at the bottom, and serves to defend the waxed part of the instrument from the rain, &c. In fig. 3. a section of this brass cap is represented, in order to shew its internal shape, and the manner in which it is screwed to the wire, projecting above the tube L. The small tube L, and the upper extremity of the large tube CDMN, appear like one continued piece, on account of the sealing-wax, which covers them both. The conical corks P of this electrometer, which by their repulsion shew the electricity, &c. are as small as

VOL. VIII. Part I.

E L E

can conveniently be made, and they are suspended by exceedingly fine silver wires. These wires are shaped in a ring at the top, by which they hang very loosely on the flat piece of ivory H, which has two holes for that purpose. By this method of suspension, which is applicable to every sort of electrometer, the friction is lessened almost to nothing, and thence the instrument is sensible of a very small degree of electricity. IM, and KN, are two narrow slips of tin-foil, stuck to the inside of the glass CDMN, and communicating with the wooden bottom AB; they serve to convey off that electricity, which, when the corks touch the glass, is communicated to it, and being accumulated, might disturb the free motion of the corks.

In regard to its use, this instrument may serve to observe the artificial, as well as the atmospherical electricity. When it is to be used for artificial electricity, this electrometer is set upon a table or other convenient support; then it is electrified by touching the brass cap EF with an electrified body, which electricity will sometimes be preserved for more than an hour. Mr Cavallo had one of these electrometers which would remain electrical for more than twelve hours, though in a room without a fire. If in an electrified state, any electrified substance be brought near the cap EF, the corks of the electrometer, by their converging, or by increasing their divergency, will shew the species of that body's electricity.

It is necessary to remark, that to communicate any electricity to this electrometer, by means of an excited electric, e. g. a piece of sealing-wax, (which we suppose is always negatively electrified), is not very readily done in the usual manner, on account of the cap EF being well rounded, and free from points or sharp edges. By the approach of the wax, the electrometer will be caused to diverge; but as soon as the wax is removed, the wires immediately collapse. The best method to electrify it, is to bring the excited wax so near the cap, that one or both the corks may touch the side of the bottle CDMN; after which, they will soon collapse and appear unelectrified: if now the wax be moved, they will again diverge, and remain electrified positively.

When this instrument is to be used to try the electricity of the fogs, the air, the clouds, &c. the observer is to do nothing more than to unscrew it from its case, and, holding it by the bottom AB, to present it to the

A

open

Electrometer.

open air, a little above his head, so that he may conveniently see the corks P, which will immediately diverge if there be any sufficient quantity of electricity; whose nature, i. e. whether positive or negative, may be ascertained by bringing an excited piece of sealing-wax, or other electric, towards the brass cap EF.

It is perhaps unnecessary to remark, that this observation must be made in an open place, as the roads out of town, the fields, the top of a house, &c.

The principal advantages of this electrometer, as stated by Mr Cavallo, are as follow.

1. The smallness of its size. Mr Cavallo made one so small, that its case, which was of brass, measured only three inches and a half in length, and nine tenths of an inch in diameter, and yet it acted perfectly well.

2. Its being always ready for experiments, without fear of entangling the threads, or having an equivocal result by the sluggishness of its motion.

3. Its not being disturbed by wind or rain.

4. Its great sensibility; and

5. Its keeping the communicated electricity longer than any other electrometer.

II. *Saussure's* ELECTROMETER. M. de Saussure's electrometer, with which he made the observations on atmospherical electricity, that have been related in the second chapter of Part V. of the article ELECTRICITY, and is represented at fig. 4. is much the same with that of Mr Cavallo above described. The following are the most material circumstances in which they differ: First, the fine wires, by which the balls are suspended, should not be long enough to reach the tin-foil which is pasted on the inside of the glass, because the electricity, when strong, will cause them to touch this tin-foil twice consecutively, and thus deprive them in a moment of their electricity. To prevent this defect, and yet give them a sufficient degree of motion, it is necessary to use larger glasses than those that are generally applied to Mr Cavallo's electrometer; two or three inches diameter will be found to answer the purpose very well. But as it is necessary to carry off the electricity which may be communicated to the inside of the glass, and thus be confounded with that which belongs to those substances that are under examination; four pieces of tin-foil should be pasted on the inside of the glass; the balls should not be more than one-twentieth of an inch diameter, suspended by silver wires, moving freely in holes nicely rounded. The bottom of the electrometer should be of metal; for this renders it more easy to deprive it of any acquired electricity, by touching the bottom and top at the same time.

In order to collect a great quantity of electricity from the air, the electrometer is furnished with a pointed wire, 15 inches or two feet long, which unscrews in three or four pieces, to render the instrument more portable; see fig. 4. When it rains or snows, the small parapluiic, fig. 5. is to be screwed on the top of the instrument, as by this its insulation is preserved, notwithstanding the rain.

This instrument indicates not only the electricity of fogs, but that also of serene weather, and enables us to discover the kind of electricity which reigns in the atmosphere; and to a certain degree, to form an estimate of its quantity, and that under two different points of

view, the degree of intensity, and the distance from the earth at which it first begins to be sensible.

A conductor raised for the purpose of making observation on atmospherical electricity will be found to exhibit signs of electricity, only when the electric fluid is more or less condensed in the air, than in the earth. Though the air resists the passage of the electric fluid, it is not absolutely impermeable to it; it suffers it to pass gradually, and generally with more ease in proportion as its mass or thickness is less. It is therefore interesting to discover at what height it is necessary to be elevated, in order to find a sensible difference between the electricity of the earth, and that of the air. A very sensible difference may be generally discovered by this instrument, at the distance of four or five feet from the ground; sometimes it may be seen if the instrument is placed even on the ground; while at others, it must be raised seven or more feet before the balls will open; sometimes, though seldom, this height is not sufficient. This distance is generally greatest when the electricity is strongest, though necessarily modified by a variety of circumstances, some of which are known, as the degree of dryness or humidity of the air, and others are unknown.

The degree of intensity, at a given height, may be discovered thus; raise the electrometer, and judge by the divisions which are placed on the edge of it, the degree of their divergence. To find the relation between this degree of divergence, and the force of the electricity, M. de Saussure took the following method: As he could not with certainty double or triple a given quantity of electricity; yet as a given force may be reduced one half, a fourth or eighth, &c. by dividing between two equal and similar bodies, the electricity contained in one; he took two of his unarmed electrometers, which were as similar as possible, and electrified one of them, so that the balls separated precisely six lines; he then touched the top thereof by the top of that which was not electrified; in an instant the electricity was equally divided between them, as was evident by the divergence of the balls, which was four lines in each; consequently a diminution of half the density had only lessened the divergence one-third. One of these electrometers was then deprived of its electricity, and was afterwards brought in contact with the other, as before; the remaining electricity divided itself again between them, and the balls fell from four to twenty-eight lines, nearly in the same proportion as before; in the third operation they fell to nineteen; in the fourth to one, where he was obliged to stop, as there was not now sufficient force in the fluid to pass from one electrometer to the other, and distribute itself uniformly between them. The same experiment, repeated several times, gave very nearly the same results. Negative electricity decreased also in the same proportion as the positive. The following table may therefore be considered as giving a general, though not exact idea of the increase in force, which corresponds to different degrees of divergence in the balls; it is only calculated to every fourth of a line; the force of electricity is always expressed by whole numbers, as it would be ridiculous to put a greater degree of exactness in the numbers than is to be found in the experiments which form the bases of the calculation.

Distance

Electrometer.	Distance of the balls in fourths of a line.	Corresponding forces of electricity.
1	—	1
2	—	2
3	—	3
4	—	4
5	—	5
6	—	6
7	—	8
8	—	10
9	—	12
10	—	14
11	—	17
12	—	20
13	—	23
14	—	26
15	—	29
16	—	32
17	—	36
18	—	40
19	—	44
20	—	48
21	—	52
22	—	56
23	—	60
24	—	64

Those who are desirous to carry this measure of the electric force further, may do it by having similar electrometers constructed, but made upon a larger scale, and with heavier balls, which would only separate one line, with the degree of electricity that makes the smaller ones diverge six lines; these would consequently measure a force 1024 times greater than that which forms the unity of the preceding table; and thus by degrees we may be enabled to discover the ratio of the strongest discharge of a great battery, or perhaps even of thunder itself, to that of a piece of amber, which only attracts a bit of straw or any other light substance.

In order to observe the electricity of the atmosphere with this instrument, we must first bring the electric fluid contained in the electrometer to the same degree of density with that at the surface of the earth; this is easily done by letting the bottom and top touch the ground at the same time; then raise the point, keeping the bottom still in contact with the ground, from whence it may be lifted up in a vertical position till the balls are level with the eye.

The second circumstance is to render the divergence of the balls, which is occasioned by the electricity of the air permanent. This is effected by touching the top of the electrometer with the finger; but here the acquired electricity becomes contrary to that of the body by which they are electrified. Let us suppose, for example, that the electrometer is at five feet from the ground, and the balls diverging; touch the top of the electrometer with the finger, and the balls will close; but they will again open, if the electrometer is withdrawn from the influence of the electricity of the air, by being brought nearer the ground, or into the house. M. Sauffure only employed this method when the electricity was so weak that he could not perceive any until the electrometer was raised considerably above his eye: as in this case he could not perceive the diver-

gence of the balls, he always endeavoured to obtain a permanent electricity in the foregoing manner.

The following example will render the use of the foregoing observations more familiar. Choose an open situation free from trees and houses, screw the conductor on the top of the electrometer, lay hold of it by its base, and place it so that the base and conductor may touch the ground at the same time; then elevate it to the height of the eye, and observe the quantity of lines, or fourths of a line, that the balls have diverged; now lower it till the balls almost touch each other, and observe at what distance the top of the conductor is from the ground; and this is the height from the ground at which the electricity of the air begins to be sensible. If the electricity of the air is sufficiently strong to make the balls diverge when it stands upon the ground, one of the lengths of the electrometer must be unscrewed from it. If the balls, however, still diverge, the other parts of the conductor should also be unscrewed, and you may mark down, that the electricity is sensible at zero, or on the surface of the earth. If, on the contrary, the electricity is so weak, as not to cause the balls to diverge when they are even with the eye, and consequently when the conductor is two feet higher, or seven feet from the ground, you should then raise it a foot higher; while it is thus elevated, touch the top with the other hand; when this hand is taken away, lower the electrometer, and if it is electrified, you may say the electricity is sensible at eight feet; if it is not, raise it as high as the arm can reach, and repeat the same operation; if any electricity is found, write down electricity sensible at nine feet; if not, mark 0, or no electricity relative to this instrument, and this mode of employing it; for signs of electricity may still be obtained, by throwing a metallic ball 50 or 60 feet into the air, which is at the same time connected with the electrometer by a metallic thread.

One advantage of this instrument is, that it will often exhibit signs of electricity when none can be obtained from a conductor of 100 feet in height, because it can more easily be preserved from humidity, &c. which will destroy the insulation of the large conductors.

This electrometer may be used instead of the condenser of M. Volta, by only placing it on a piece of oiled silk, somewhat larger than the base of the instrument; but in this case, it is the base, and not the top of the instrument, which must be brought into contact with the substance whose electricity is to be explored.

It is easy to discover also by this instrument, the electricity of any substance, as of cloths, hair of different animals, &c. For this purpose, it must be held by the base, and the substance rubbed briskly (only once) by the ball of the electrometer; the kind of electricity may be ascertained in the usual manner. It is proper, however, to observe here, that as the top of the electrometer acts in this case as an insulated rubber, the electricity it acquires is always contrary to that of the rubbed body.

III. *Cadet's* ELECTROMETER, is thus described by the author, as translated in Nicholson's Journal.

Fig. 6. In a glass tube A, 18 or 20 inches long, is inclosed another shorter tube X, sealed at both ends. This tube contains a graduated scale: one of the ends of these two tubes is cemented in a handle of turned wood,

Electrometer.

wood, C, by which it is held in the hand; the other end is closed by a brass cap, D; the distance between the extremities of the small tube and that of the large one is filled with red wax, B, B; on the cap D is screwed at pleasure, either a ring E, or a brass hook F. The ring is used for applying the instrument to the ball of a conductor, and the hook when it is hung to a ring: on the cap D is a brass stem G, terminating by a knob. This stem is bended, and the extremity of its knob must be directly beneath the line with which the graduated scale of the small tube commences.

Round the large tube is a brass ring H, half of which extends to the length of twelve or fifteen lines, in the form of a half tube P, applied against the sides of the tube. This gutter serves to mark the degrees, by sliding along the graduated scale by means of a button beneath I. On the ring H is fixed one of the small electrometers invented by Saussure, K, K, which is surmounted by a stem V, on which stem is fixed at pleasure either a point L, or a ball M, of the same size as that which terminates the stem G, opposite which it is placed. The extremity of this point or ball must be placed immediately over the extremity of the half tube or scale P, and horizontally to the centre of the ball, which terminates the stem G.

At the top of Saussure's electrometer is a small ring N, which serves to connect it with the chain Z when required.

To explain the use of this instrument by a single experiment, charge a Leyden jar, till the spontaneous overflowing announces it to be saturated. Then place the ring E on the knob of this bottle, and cause the electrometer of Saussure, armed with its point, to slide towards it. Observe the degree at which the divergence of the thread stream commences, and at that instant suppress the point, and adapt in its place the ball M. Continue to advance the electrometer of Saussure till the electric pressure of the atmosphere in the jar causes the threads to diverge; again observe the degrees, replace the point L, and close the shutters of the room; then continue to advance the electrometer till the luminous point appears, which again affords new degrees. Lastly, replace the ball M, and fix the chain Z to the small ring N; cause it to communicate with the exterior coating of the jar, and advance the electrometer till the explosion takes place. Then comparing the different degrees, we may ascertain the comparative difference between the respective methods.

As soon as these relative proportions have been once accurately ascertained by attentive observations, one of those methods alone will be sufficient for measuring the intensity of electricity; and, in fact, if the body intended to be submitted to examination be little charged with the electric fluid, the diverging of the threads, by means of the point, will fix the limits of the electric atmosphere: if it be more, the pressure of the atmosphere on the ball M, which is substituted for the point, will indicate this quantity. In short, if the body be loaded with a considerable mass of electric matter, it will be shown by the luminous point. If a Leyden jar, instead of being positively, is negatively electrified, the point indicates it at the same time that it measures the electric atmosphere, for instead of a luminous point, a star

will be observed upon the ball of the jar, and another at the end of the point.

Electrometer.

Let us now apply this electrometer to useful observations,

In order to connect the idea of a determinate quantity of fluid to each degree of the electrometer, it is necessary to compare these degrees with the known quantities. Suppose for instance we have a jar, the coating of which is six inches square; electrify it till a spontaneous discharge takes place, and remark, by means of Henly's electrometer, at what degree this discharge is effected. Again, electrify the jar, till it is nearly saturated, and measuring with this electrometer, observe, that the luminous point appears for instance at two degrees; then say, that when the electrometer, applied to an electrified body, marks two degrees, the body contains six inches square of electricity. Repeat this experiment with a plate of glass, the coating of which is seven, eight, ten, or twelve square inches, and we may form a scale of proportion, which is of the greatest utility in accurate experiments.

"In endeavouring to ascertain some of these propositions, (says M. Cadet), I have made an observation which has convinced me of the utility of my electrometer in discovering the capacity of electric apparatus. Having taken a jar from an electric battery, I electrified it, and measured it with a point which I passed along a string of silk; on observing the distance at which the luminous point appeared, I joined this jar to another of the same size, and imagined that by doubling the quantity of matter, the measure I had taken would also be doubled; on the contrary, however, the latter measure was not more than about one-third of the former: I then added a third bottle; and still obtained nearly the same result; whence the following proposition appears to be established; namely, that the extent of the electric atmosphere is in an inverse ratio to the quantity of fluid accumulated. Another observation which I have several times made, on measuring the electric atmosphere of a conductor, is, that the limits of this atmosphere form an elliptic figure around the body, nearly similar to that represented at fig. 7.

"This doubtless arises from the electrified body suspended in a chamber, being nearer to the earth than the ceiling; but it would be a curious experiment to measure it at an equal distance from every attracting body, in order to observe whether the fluid has not really a tendency to descend towards the earth, rather than in any other direction. It is my intention to repeat this experiment, as I consider it of great importance to ascertain whether electricity gravitates towards the globe.

"From these first attempts, I conceive my electrometer would be well adapted for measuring the absolute capacity of Leyden jars, and also their capacity with regard to their size, or to the quality of the glass of which they are constructed; for the latter, by its greater or less density, absorbs a greater or less quantity of fluid."

IV. *Lawson's* ELECTROMETER. This is a simplified improvement on Brooke's steelyard electrometer, and should have been described when that instrument was mentioned, instead of Mr Adams's; but it did not occur to us till after that sheet was printed.

The

Electrometer.

The following account is given of this electrometer, in a letter from Mr Lawson to the editor of the Philosophical Magazine.

“Some time ago it struck me that some additions to Brooke’s electrometer might be made, so as to fit it for a good discharging electrometer to measure the repulsion between two balls (of a certain size) in grains, and also effect the discharge of a battery at the same time. The instrument known by the name of Cuthbertson’s discharging electrometer, (See ELECTRICITY, N^o 203.) was at that time the best, and indeed the only instrument for discharging batteries or jars by its own action, then made; but I think this will be found, in the essentials, and in the theory and use, a more perfect instrument.

“On the basis (fig. 8.) is fixed the glass pillar G, supporting the hollow brass ball B. I is a light graduated brass tube, divided (from the weight W towards the ball B) into thirty parts, representing grains. W is a sliding weight. L, a light brass ball screwed to the end of the tube I. On the other end of which tube adjusts the heavy counter-balance ball C, the tube I and its two balls being suspended at their common centre of gravity by a silk line in the centre of the ball B, the mechanism of which is shewn in fig. 9. The brass ball F is stationary, and of the same size as the ball L; and is fixed by, and adjusts close to, the ball L, or at any lower station between that and the ring r. The brass tube to which the ball A is fixed is divided into inches, halves, and quarters: (a more minute division is unnecessary and improper). The divisions begin, or the line o is marked on the said tube at the ring r, when the three balls A, L, F, are close together. The ring r serves as an index, as the divisions pass in succession into the glass tube P on lowering the ball A. The hook H is screwed into the base of P. The quadrant, or Henly’s electrometer, Q, is supported in a long brass stem, to keep it out of the atmosphere of the lower part of the instrument. Fig. 9. shows the internal construction of the ball B, fig. 8. In the first place the ball screws in half, horizontally. The light tube I passes through the ball, and is suspended nearly in the centre of it by some silk twist, s, which small silk twist is fixed into the eye of the adjusting wire, a, part of which wire is filed square and goes through the square hole b. The nut n screws on a, and serves to adjust the light tube I vertically. The light plates PP are of copper, and move freely on the wire w w somewhat like a hinge, and rest on the copper wires CC, serving to make the direct communication between the inside and out of the battery or jar. NN are notches serving to let the tube I descend when the discharge is made. Into the tube Z the glass pillar is ground. Note, that at the bottom of the notch N is a piece of brass filled with a Y, and so placed as to keep the centres of the balls L and F, fig. 8. under each other when they come close together.

“When the instrument is adjusted, which is done by placing the weight W, fig 8. at o on the line of grains, and then screwing or unscrewing the counterbalance ball C, till the tube I rises slowly into its horizontal position; then set the ball A at the distance from the ball L that you choose, and the weight W placed at the division or number of grains that you wish the repulsive power of the electricity to arrive at before the discharge

is made: this being done, connect the battery or jar with the ball B, by means of the wire y, the end of which goes into B at the hole X, and should stand at right angles to B, the ball of y resting on the battery: then connect the outside of the battery or jar with the hook H. As the battery charges, the electrometer Q continues to rise; and when it is so highly charged that the repulsive power between the balls L and F is equal to the number of grains at which the weight W was placed, the ball L will descend, and deliver the charge of the battery to the ball A. The substance or thing through which the shock is intended to be passed, must form part of the communication between the hook H and the outside of the battery or jar.”

V. Hauch’s ELECTROMETER. Fig. 10. contains a representation of this electrometer, and the different parts of which it consists. OP is a board of dry mahogany, twelve inches in length and four in breadth, which serves as a stand for the instrument. In this board are fastened two massy glass pillars, M and N, which support the two brass caps or rings GG, with the two forks of tempered steel KK screwed into them. The two rings GG are well covered with varnish.

In the ring is fastened a brass rod, which terminates in a ball E of the same metal, and an inch in diameter. The length of the rod and ball together is four inches and a half.

A very delicate beam AB, the arms of which are of unequal length, moves on a sharp triangular axis (a knife edge) of well tempered steel, on the fork K of the pillar M. It is seventeen inches in length, and so constructed that the short arm forms a third, and the long one two-thirds of the whole beam. The short arm of brass furnished with the ball B, exactly of the same size as the ball E, is divided into forty five parts-equivalent to grains. The long arm A is of glass covered with copal varnish, and ends in an ivory ball A, into which is fitted an ivory hook R, destined to support the ivory scale H. In order to render the insulation more complete, this scale is suspended by three hairs.

A very delicate beam CD, eleven inches in length, moves on an axis like the former, on the pillar N, though not here shewn. This beam is proportioned in the same manner, one arm being a third and the other two thirds of the whole length. The long arm of brass is furnished at the end with a ball D, and divided into thirty parts corresponding to grains. The short arm of glass terminates in a long roundish plate C, covered with copal varnish. The steel forks are shewn by the sections of the two brass caps FF, as are also the two knife edges L, L. By these caps the escape of the electric matter is partly prevented.

A glass ring Q, capable of being moved along the short arm of the upper beam AB, shews by means of marks determined by trial and cut out on the beam, the number of grains which must be placed in the small scale to restore the equilibrium of the beam, at each distance of the ring Q from the point of suspension.

On the long arm CD of the lower beam there is also a moveable ring S, which, like the ring Q, shews in grains, by its distance from the point of suspension, the power requisite to overcome the preponderance of LD in regard to LC.

The power necessary for this purpose will be found, if the

Electrometer.

Electrometer. the shell H, which weighs exactly fourteen grains, be suffered to sink down on the glass plate C, and the ring *s* be pushed forwards till both the arms of the beam are in equilibrium. The part of the beam on which the ring *s* has moved, is divided into fourteen parts, so that *o* marks the place where the ring *s* must stand when the beam, in its free state, is in equilibrium; and 14 stands at the place where the ring *s* again restores a perfect equilibrium when the shell H is laid on the glass plate C. Each of these parts, which are divided into quarters, indicates a grain. The lower divisions of the scale will be found with more accuracy, if quarters of a grain be put, in succession, into the shell H (after it has been laid on the plate C), and the ring *s* be moved between each quarter of a grain until the perfect equilibrium be restored. This place on the beam is then to be marked, and you may continue in this manner until the 30th part of a grain be given. Both scales, for the sake of distinctness, are divided only so low as quarters of a grain; though the instrument is so delicate, and must absolutely be so, that 1-20th of a grain is sufficient to destroy the equilibrium.

The two glass pillars M and N, together with the steel forks affixed to them, are so fitted into the stand that both the beams lie parallel to each other as well as to the rod GE. In this position of the beams AB, the balls B and E are just in contact. The smallest glass pillar N is of such a height that the ball of the beam CD stands at the distance of exactly four lines from the ring G, and cannot move without touching the latter. The small shell H is suspended in such a manner that there is a distance of exactly two lines between it and the shell C. In each of the brass rings GG is a small hole, that the instrument may be connected with the two sides of an electric jar. I is a brass wire, with a hollow bit of ivory, *a*, destined to support the beam CD, which is necessarily preponderate at D, in order to prevent oscillation between the discharges to be examined by the instrument.

It may be readily comprehended that, when the beam AB has moved, A must pass over twice the space that B does; and that in the beam CD, the case is the same in regard to C and D. If AB be therefore connected with the external, and CD with the internal side of a battery, but in such a manner that the instrument is at a sufficient distance beyond the electric atmosphere; and if the battery be charged, the repulsive effect of the electric power will oblige the ball B to separate from the ball E; the shell H must therefore naturally sink down with double velocity, so that when the ball B rises a line, the shell H must sink two: when it reaches this depth it will touch the shell C, and the latter, by the power excited in it, will be obliged to sink, by which D must naturally again ascend in a double proportion to the sinking of C; so that when C has fallen two lines, D must have ascended four, and D that moment touches the ring by which the two sides of the battery are connected with each other, and discharges the battery.

But as the attractive electric power between unlike atmospheres, under like circumstances, is at least as strong as its repulsive power between like atmospheres, it would thence follow, that the electric power, instead of repelling the ball B from the ball E, would rather attract D, and by its contact with G, promote the dis-

charging; by which the instrument would fail of its object, and be subjected to the temperature of the atmosphere like all other electrometers; and, besides this, the electric power could no longer be determined by weight. To obviate this inconvenience, the instrument, in all electrical experiments, must be applied in such a manner that the power with which the ball D is attracted by AB may exceed in strength the power required to repel the ball B from the ball E. For this purpose the ring *s* must always be removed two divisions farther on CD, towards D, than the ring Q is shifted on AB towards B. If, for example, an electric force were required equal to eight grains, according to this electrometer, the ring Q must be removed to the place where 8 stands, and the ring *s* to the place marked 10. The repulsive power will then naturally repel the balls B and E before G is in a condition to attract the ball D, as a power of two grains would be necessary for this purpose, besides that of the eight already in action. The shell H with its weight of fourteen grains, will easily overcome the preponderance of LD or LC, as it amounts only to ten grains, and therefore nothing exists that can impede the discharging.

When the ring *s*, according to the required power, is removed so far towards D, that the shell H is not able by its weight to destroy the preponderance of LD in regard to LC, the active power of the shell H must be so far increased by the addition of weights, that it can act with a preponderance of four grains on the plate C. If, for example, an electric power of 14 grains be required, the ring *s* must be removed to 16, by which LD rests upon *a*, with a preponderance of 16 grains in regard to LC. Now, to make H act on the plate C with a preponderance of four grains, it must be increased to 20 grains, that is, six grains weight more must be added, as it weighs only 14; which six grains are again laid upon LB; and therefore the ring Q is shifted to 20, as the strength of the repulsive power is pointed out by 14 grains.

If an electric power of 25 grains be required, the ring *s* must be removed to 27, and the weight of 17 grains be put into the shell H, in order to produce a preponderance of four grains in regard to *s*. These 17 grains are added to the required power of 25 grains, and the ring Q is pushed to 42, &c. In this manner the repulsive power always acts before the attractive power can.

It may be readily perceived that the faults and inconveniences common to all the electrometers hitherto employed, and which have been already mentioned, cannot take place here; because the discharging is performed by immediate connection between the positive and negative electricity in the instrument itself, without any external means being employed.

One of the most essential advantages of this instrument is, the certainty with which the same result may be expected when the experiment is repeated. From the same degree of electric power, whatever be the temperature of the atmosphere, it will always be necessary to commence the separation of the two balls B and E from each other, the quantity of coated glass and the distance of the ring Q from the axis L being the same.

Another no less important advantage of this instrument is, that in an experiment where the same electric power,

Electrometer. power, often repeated, is necessary to ascertain the result with accuracy; such, for example, as the charging a battery through acids, water, &c.; the same degree of precaution is not necessary as is indispensibly so in any other electrometer, as the person who puts the machine in motion has nothing to do but to count how often the electrometer discharges itself; and the instrument may be inclosed in a glass case, or prevented in any other manner from external contact, or any other circumstances which might render the experiment uncertain.

"I flatter myself (says M. Hauch), that the simplicity of the construction of this instrument, the facility with which it may be made at a very small expence, and the certainty that two instruments, prepared according to the same scale, with a like quantity of coated glass, must exactly correspond with each other; but above all, that the certainty and accuracy by which experiments may be made with it, and by these means be accurately described, are advantages which will not be found united in any of the electrometers hitherto invented*."

We shall close this account of electrometers with describing the construction and use of M. Coulomb's electrometer, or, as he calls it, *Electrical Balance*.

ABDC (fig. 11.) represents a glass cylinder, twelve inches in diameter and the same in height, covered by a glass plate fitted to it by a projecting fillet on the under surface. This cover is pierced with two round holes one inch and three fourths in diameter. One of them *f* is in the centre, and receives the lower end of the glass tube *fh*, of twenty-four inches height, which is fixed in the hole with a cement made of sealing-wax, or other electric substance. The top of this tube receives the brass collar H, (fig. 12. N^o 3.) bored truly cylindrical with a small shoulder, which rests on the top of the tube. This collar is fastened with cement, and receives the hollow cylinder ϕ (fig. 12. N^o 2.), to which is joined the circular plate *ab*, divided on the edge into 360 degrees. It is also pierced with a round hole G in the centre, which receives the cylindrical pin *i* (fig. 12. N^o 1.) having a milled head *b*, and furnished with an index *io*, whose point is bent down so as to mark the divisions on the circle *ab*. This pin turns stiffly in the hole G, and the cylinder ϕ moves steadily in the collar H. To the lower end of the centre pin is fastened a little pincer, *q*, formed like the end of a port-crayon, and tightened by the ring *q*, so as to hold fast the suspension wire, the lower end of which is grasped by a similar pincer, P *o* (fig. 13.) tightened by the ring ϕ . The lower end ϕo is cylindrical, and is of such a weight, as to draw the wire perfectly straight, but without any risk of breaking it. It may be made equal to half of the weight that will just break it.

This pincer is enlarged at C, and pierced with a hole, which tightly receives the arm *g C q* of the electrometer. This arm is eight inches long; and consists of a dry silk thread, or a slender straw completely dried, and dipped in melted lac or fine sealing wax, and held perpendicularly before a clear fire, till it become a slender cylinder of about one tenth of an inch in diameter. This occupies six of the eight inches, from *g* to *q*: the remaining two inches consist of a fine thread of the lac or sealing-wax, as it drains off in forming the arm. At *a*, is a ball of pith or fine cork,

one-fourth or one-half of an inch in diameter, made very smooth, and gilded. It is balanced by a vertical circle of paper *g*, of large dimensions, made stiff with varnish. The resistance of the air to this plane soon checks the oscillations of the arm.

The whole instrument is seen in its place in fig. 11. where the arm hangs horizontally about the middle of the height of the great cylinder. In its oscillations the ball *a* moves round in a circle, whose centre is in the axis of the whole instrument. Its situation is indicated by a graduated circle $\alpha o q$, drawn on a slip of paper, and made to adhere to the glass by varnish. The electrified body whose action is to be observed, is another small ball of cork *t*, also gilt, or a brass ball well polished. This is carried by a stalk of lac *m q*, inclosing a dry silk thread. This stalk is grasped by a clamp of cleft deal, or any similar contrivance, which is made to lie firm on the glass cover. When this ball is let down through the hole *m*, it stands so as to touch the ball *a* on the arm, when that ball is opposite to \circ on the graduated circle.

In order to electrify the ball *t*, we are to employ the insulating handle, fig. 14. which is a slender stick of sealing-wax or lac, holding a metal wire that carries a small polished metallic ball. This is to be touched with some electrified body, such as the prime conductor of a machine, the knob of a jar, &c. This electrified ball is to be introduced cautiously into the hole *m*, and the ball *t* is to be touched with it. The ball *a* is immediately repelled to a distance, twisting the suspension wire, till the force of twist exerted by the wire balances the mutual repulsion of the balls *t* and *a*.

This is the process for examining the law of electric action. When it is desired to examine the action of different bodies in different states, another apparatus is wanted. This is represented by the piece *c A d* (fig. 15.) consisting of a plug of sealing-wax A, fitting tightly into the hole *m*, and pierced by the wire *c d*, hooked at *c*, to receive a wire to connect it occasionally with an electrified body, and having below a polished metal ball *d*.

The instrument is fitted for observation in the following manner: The milled button *b* is turned at top, till the twist index *io* is at the mark \circ of the twist circle. Then the whole is turned in the collar H, till the ball *a* stand opposite to the mark \circ of the paper circle $\alpha o Q$, and at the same time the ball *t* or *d* is touched. The observation is thus made. The ball *t* is first electrified, as just described, and thus *a* is repelled, and retiring twists the wire, settling, after a few oscillations, at such a distance as is proportional to the repulsion. The twist-index is now turned so as to force *a* nearer to *t*. The repulsion thus produced is estimated by adding the motion of the index to the angle at which the ball first stopped. Giving the index another, we have another repulsion, which is estimated in a similar way, and thus we obtain as many measures as required.

It is not necessary to make this instrument of very large dimensions; one 14 inches high, and five in diameter, of which the arm *ag* should occupy two inches and an half, will be sufficiently large for most purposes. The diameter of the glass cylinder must always be double the length of the arm *ag*, that the position of this may not be disturbed by the action of the glass.

Dr Robison considered this electrometer as one of the

* *Phil. Magaz.* vol. 1v.

Electrometer. the most valuable instruments that have been made, as it is not only extremely delicate, but gives absolute measures with the greatest accuracy. For all purposes in which only repulsions were to be measured, he preferred it to his own instrument described in ELECTRICITY, N° 206.

He, however suggested several improvements in it, which are deserving of attention.

The bottom should be furnished with a round hole, admitting the lower end of the cylinder *Cc* belonging to the lower pincer (when the wire is strained at both ends) to hang freely, by which means much tedious oscillation will be prevented. It is much more convenient to have the suspension wire strained at both ends; and it should extend as far below the arm as above it, and the lower extremity should be grasped by a pincer that turns by a milled head in a hole at the end of a slender spring. The instrument may then be speedily adjusted by placing the twist index at 0, and gently turning the lower button till the ball *a* point exactly at 0 on the paper circle.

The instrument will be greatly improved, if, in place of the apparatus with the ball *t*, we substitute the piece represented at fig. 15. making some little changes in its construction. Thus, instead of the wire *cd*, is used the smallest glass tube that will admit of being varnished on the inside, which is done by drawing through it a silk thread dipped in varnish, made of lac.

The outside of the tube must also be varnished, and a brass ball *d* fixed at its lower end, and a slender wire, furnished by a ball, is to be inserted into the tube, so as to touch the ball below. The position of the ball *d* will not be liable to alteration, when the hole *m* is once stopped with the plug. In making delicate experiments, the upper ball *c*, must be touched with the charger, represented at fig. 14. by which means the ball *d* is electrified. Then drawing out *C* by means of the forceps, the ball *d* is left completely insulated. In examining the electricity of the atmosphere, to which purpose this instrument is well adapted, the wire must be allowed to remain in the tube.

It was by means of this incomparable instrument, that M. Coulomb made the valuable experiments, to which we alluded in the article ELECTRICITY, when treating of the law of action of the electric fluid. By means of this electrometer, he also made his experiments on the dissipation of electricity into the air, and along imperfect conductors. He ascertained the law of dissipation into the air from bodies in contact, and the relation which this bore to the original repulsion, by first observing the gradual approach of the ball *a* towards *t*, in proportion as the electricity dissipated from both, and then slackening the twist index till the ball *a* resumed its original situation.

The following was the general result of Mr Coulomb's experiments.

That the momentary dissipation of moderate degrees of electricity is proportional to the degree of electricity at the moment. He found that the dissipation is not sensibly affected by the state of the barometer or thermometer; nor is there any sensible difference of bodies of different sizes or different substances, or even different figures, provided that the electricity is very weak.

But he found that the dissipation was greatly affected

Electrometer. by the different states of humidity of the air. In the scale of Sauffure's hygrometer, the relation to the quantity of water which a cubic foot of air is capable of holding in solution is distinctly marked; the relation of this solution to the dissipation of electricity in Coulomb's experiments may hence be seen in the following table, the first column of which marks the degrees of Sauffure's hygrometer, the second how many grains of water are dissolved in a cubic foot of air at each degree, and the third column shews the corresponding dissipation per minute.

69	6,197	$\frac{1}{60}$
75	7,295	$\frac{1}{48}$
80	8,045	$\frac{1}{39}$
87	9,221	$\frac{1}{34}$

Hence it follows, that the dissipation is very nearly in the triplicate ration of the moisture of the air. Thus

if we make $\frac{69}{41} = \frac{7,197}{6,180}^m$; *m* will be = 2,764. If we

make $\frac{80}{49} = \frac{8,045}{6,180}^m$; *m* will be = 2,76; and if we

make $\frac{87}{44} = \frac{9,240}{6,180}^m$; *m* will be = 3,61; or at a medium *m* will be = 3,40.

The immediate object, that M. Coulomb had in view in his experiments, was to ascertain the diminution of repulsion. He found that this, in a given state of the air, was a certain proportion of the whole repulsion taken at the moment of diminution, which is double the proportion of the density of the fluid; for the repulsions by which we judge of the dissipation are reciprocal, being exerted by every particle of fluid in the ball *t* of the electrometer, on every particle of fluid in the ball *a*. The diminution of repulsion is therefore proportional to the density of the electric fluid in each ball; and, as during the whole dissipation, the densities continue to have their original proportion, and as the diminution of repulsion is directly proportional to the diminution of the products of the densities, it is consequently directly proportional to the square of either. If we put *d* for the density, the mutual repulsion will be represented by *d*², and its momentary diminution by the fluxion of *d*², or 2 *dd* = 2 *d* × *d*. But 2 *d* × *d* : *d*² = 2 *d* : *d*. The diminution of repulsion observed by experiment will be to the whole repulsion, in double the proportion that the diminution of density, or the dissipation of fluid will have to the whole quantity of fluid at the moment of observation. Let us, for instance, suppose the observed diminution of repulsion to be $\frac{1}{40}$; we may conclude, that the quantity of fluid lost by dissipation is $\frac{1}{80}$. M. Coulomb did not examine the proportion of the dissipations from bodies of various sizes. But we know, that if two spheres communicate by a very long canal, their superficial densities, and the tendencies of fluid to escape from them, are inversely as the diameters of the spheres. Now, in a body that has twice the diameter of another body, the surface of the former is quadruple of that of the latter; and though the tendency of fluid to escape from the former is only the half of its tendency to escape from the latter, yet the greater surface of the former may so far make up for its smaller density, that

the

Electrometer. the diffipation of fluid from a large sphere may in fact be greater than that from a small one in the same given time.

We have remarked above, that these experiments were made in a particular state of the air; and the law of diffipation ascertained by them is of course adapted only to that given state. In a different state of the air, even if this should be impregnated with the same proportion of moisture, the law of diffipation may be different. The inference which M. Coulomb expected to draw from his experiments was, that the ratio of diffipation would prove to be less than the cube of the quantity of water held in solution, except when that quantity of water was what the air was capable of holding in solution at the given temperature.

This is agreeable to observation; for we know that air which is considered as dry, that is, when it is not nearly saturated with moisture, is the most favourable to electrical phenomena.

Such is the general result of Coulomb's experiments on the diffipation of electricity into the air.

The method in which M. Coulomb examined the diffipation along imperfect conductors, by means of this instrument, was, by completely insulating the ball *t*, and then, after observing the loss sustained by a body in contact with it from the air, sliding a metallic rod down the insulating stalk, till the diffipation began to exceed what took place only by the air.

From his experiments respecting the diffipation along imperfect conductors, he found that this took place in a different manner from that in which electricity escaped by communication with the contiguous air. The electricity seems to be diffused chiefly along the surface of the insulator, and appears principally to be produced by the moisture that is more or less attached to it. M. Coulomb illustrates this in the following manner.

Water is found to adhere to the surface of all bodies, from which it is prevented by adhesion from escaping when the bodies are electrified, and is thus rendered capable of receiving a greater degree of electric power. Let us suppose that the particles of moisture are disposed uniformly over the surface, with intervals between them; the electricity that is communicated to one particle, must acquire a certain degree of density, before it can fly from this particle to the next, across the intervening insulating space. When an imperfect conductor of this kind is electrified at one extremity, the communicated electricity, in passing to the other extremity, must be weakened every step in passing from particle to particle.

Suppose we have three adjacent particles, which we may call *a*, *b*, and *c*; we infer from N^o 374 of the article ELECTRICITY, that the motion of *b* is sensibly effected, only by the difference of *a* and *c*; and therefore the passage of electric fluid from *b* to *c*, requires that this difference be superior, or at least equal to the force necessary for clearing this coercive interval. Let a particle pass over. The density of fluid of the particle *b* is diminished, while the density of the particle on the other side of *a* remains as before. Therefore some fluid will pass from *a* to *b*, and from the particle preceding *a* to *a*; and so on, till we come to the electrified end of this insulator. It is plain, from this consideration, that we must at last arrive at a particle beyond *c*, where the whole repulsion of the preceding

particle is just sufficient to clear the coercive interval. Some fluid will come over; and the repulsion of this, acting now in the opposite direction, will prevent any fluid from coming to supply its place in the particle which it has just quitted; the transference of fluid will therefore stop here, and beyond this point the insulation will be complete. Hence we perceive that there is a mathematical relation between the insulating power, and the length of the canal; and this may be ascertained by the theory which we adopted in the article ELECTRICITY. We shall here give an instance of this investigation; and, for the sake of simplicity, we shall take a very probable case, viz. where the insulating interval, or, as we may more properly call it, the coercive interval, is equal in every part of the canal.

Let R represent the coercive power of the insulator, or the degree of force required to clear the coercive interval between two particles. Suppose a ball C, fig. 16. suspended by a silken thread AB; and let us denote the quantity of redundant fluid in the ball by C, and let the densities at the different points of the canal be denoted by AD, P*d*, &c. ordinates to some curve D*d*B, cutting the axis in B, the point where the thread AB begins to insulate completely. Let P*ρ* be an element of the axis; draw the ordinate *ρf*, a tangent to the curve *d*fE, the normal *d*E, and draw *f*e perpendicular to P*d*. Suppose AC=*r*, AP=*x*, and P*d*=*y*. Then we shall have P*ρ*=*x*, and *d*e=-*y*. It was shewn in N^o 374. of the article ELECTRICITY, that the

only sensible action of the fluid on a particle at P is $\frac{yy}{x}$, when the action of the redundant fluid in the globe on the particle at P, having the density *y*, is denoted by $\frac{Cy}{(r+x)^2}$. Therefore $\frac{yy}{x}$ is =R, the coercive power of

the thread, which is supposed to be constant, $\frac{Pd \times de}{P\rho}$ is therefore equal to some constant line R. But P*ρ* (or *f*e) : *d*e = P*d* : PE. The subnormal PE, is therefore a constant line. But as this is the property of a parabola, the curve of density D*d*B must be a parabola, of which 2 PE = 2 R, is the parameter.

COR. 1.—The densities at different points of an imperfect insulator are in the subduplicate ratio of their distances from the point of complete insulation: for P*d*² : AD² = BP : BA.

COR. 2.—The lengths of canal requisite for insulating different densities of the electric fluid are in the duplicate ratio of their densities; for AB = $\frac{AD^2}{2PE}$, and PE is a constant quantity.

COR. 3.—The length of canal requisite for insulation is inversely as its coercive power, and may be represented by $\frac{D^2}{R}$. For AB = $\frac{DA^2}{2PE} = \frac{D^2}{2R}$.

If we reflect on this theory, we shall perceive, that our formulæ determine the distribution of fluid along the surface of an imperfect conductor, only in a certain manner, supposing that the ball C has received a certain determinate portion of fluid, for this portion diffusing itself, particle by particle, through the conducting matter, will extend to *b* in such a manner, as that

Electrometer. the repulsion shall be everywhere in equilibrio with the coercive power of the insulating interval, taken at a *maximum*. We must here remark that this resistance is not *active*, but only coercive, and may be compared to the resistance afforded by viscosity or friction. Any repulsion of electric fluid, which falls short of this, will not disturb the stability of the fluid that is spread along the canal, according to any law whatever. So that if AD represent the electric density of the globe, and remain constant, any curve of density will answer, provided that $\frac{dd}{x}$ be everywhere less than R. It is there-

fore an indeterminate problem, to assign in general the disposition of fluid in the canal. The density is as the ordinates of a parabola on this supposition only that the maximum of R is everywhere the same. And, in this case, the distance AB is a minimum: for, in other

cases of density we must have $\frac{dd}{x}$ less than R. If, there-

fore, we vary a single element of the curve D d B, in order that the stability of the fluid may not be disturbed, having d constant, we must necessarily have x larger,

that $\frac{dd}{x}$ may still be less than R; that is, we must

lengthen the axis.

The reasonings which have thus been deduced from theory, were confirmed by M. Coulomb in a numerous set of experiments. These are chiefly valuable for having stated the relation that subsists between the electric density, and the length of support necessary for complete insulation. But as M. Coulomb has not given us the scale of his electrometer, according to which the absolute measures of the densities were determined, the experiments can be of but little use till this be known.

We hinted, at the end of the theoretical part of ELECTRICITY, that the theory of Volta's *condenser* might be more satisfactorily explained after we had considered the above experiments of Coulomb. The account which we gave of the condenser in Chap. xiii. of that article, (chiefly from Cavallo), was the only one we could properly give in that early part of our view of the science. We are now prepared for a more scientific account of the effects of that instrument. The following is nearly the manner in which Dr Robison considered the subject.

Let the cover of an electrophorus be furnished with a graduated electrometer, such as may indicate the proportional *degrees of electricity*; electrify it positively to any degree, we shall suppose six, while it is held in the hand, at a little distance, directly over a metallic plate lying on a wine glass, or such like insulating stand, but made to communicate with the ground by a wire. Now bring it gradually down towards the plate. Theory teaches, and we see it confirmed by experiment, that the electrometer will gradually subside, and will perhaps fall to 2°, before the electricity is communicated in a spark: but let us stop it before this happens; the attraction of the lying plate produces a compensation of four degrees of the mutual repulsion of the parts of the cover, by condensing the fluid on its inferior surface, and forming a deficient stratum above. This needs no farther explanation, after what we said under ELECTRICITY, on

the charging of coated glass plates. Now we may suppose that the escape of the fluid from this body into the air, begins as soon as it is electrified to 6°, and that it will fly to the insulated plate with the degree 2, if it be brought nearer. But if we can prevent this communication to the insulated plate, by interposing an electric, we may electrify the cover again, while so near the metallic plate, to 6°, before it will pass off into the air. If now it be removed from the lying plate, the fluid would cause the electrometer to rise to 10°, if it did not immediately pass off; and an electric excitement of any kind which could raise this body only to 6° by its intensity, will, by means of this apparatus, raise it to the degree 10, if it be sufficiently copious in extent. If we do the same thing when the wire which connects the lying plate with the ground is taken away, we know that the same diminution of the electricity of the other plate cannot be produced by bringing it down near the lying insulated plate.

The theory of Volta's *condenser* now becomes very simple. M. Volta seems to have obscured his conceptions of it, by being intent on the electrophorus which he had lately invented, and was thus led into fruitless attempts to explain the advantages of the imperfect conductor above the perfect insulator. But the condensing apparatus is wholly different from an electrophorus; its operations are more analogous to those of a coated plate not charged, and insulated only on one side; and such a coated plate lying on a table will be a complete condenser, if the upper coating be of the same dimensions as the plate of the condenser. All the directions given by M. Volta for preparing the imperfect conductors prove, that the effect produced is to make them as perfect conductors as possible for any degree of electricity that exceeds a certain small intensity, but such as shall not suffer this very weak electricity to clear the first step of the conducting space. The marble must be thoroughly dried, and even heated in an oven, and either used in this warm state, or must be varnished, so as to prevent the reabsorption of moisture. We know that marble of slender dimensions, so as to be completely dried throughout, will not conduct electricity till it has again become moist. A thick piece of marble is rendered dry only superficially, and still conducts internally. It is then in the best possible state for a condenser. The same is the case with dry unbaked wood. Varnishing the upper surface of a piece of marble or wood is equivalent to covering it with a thin glass plate. Now by this method of covering the top of the marble, a book, or even the table, with a piece of clean dry silk, they all become most perfect condensers. This view of the matter has great advantages. We learn from it how to form a condensing apparatus much more simple and at the same time much more efficacious. We require only the simple moveable plate, which must be covered on the under side with a very thin coating of the finest coach-painters varnish. By connecting this, by a wire, with the substance whose weak electricity is to be examined, this electricity will be raised in the proportion of the thickness of the varnish to the fourth of the plate's diameter. This condensation will be produced by detaching the wire from the insulating handle of the condensing plate, and then lifting this from the table on which it was lying. It will then afford sparks, though the original electricity

ELECTROMETER.

Plate CC.

Fig. 1.

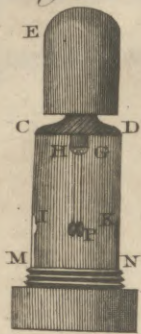


Fig. 2.

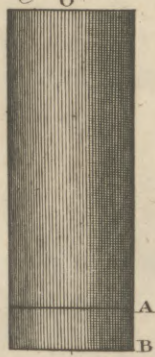


Fig. 3.



Fig. 4.

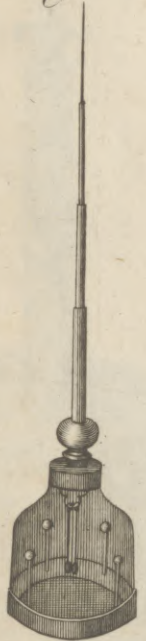


Fig. 6.

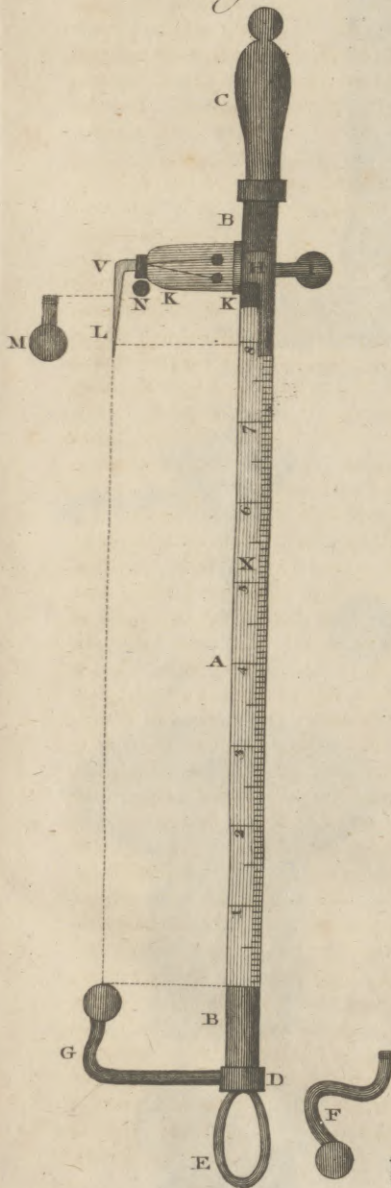


Fig. 8.

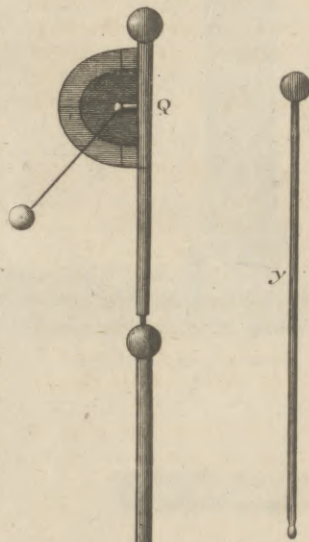


Fig. 7.

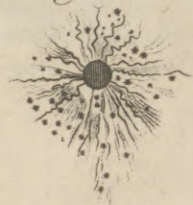
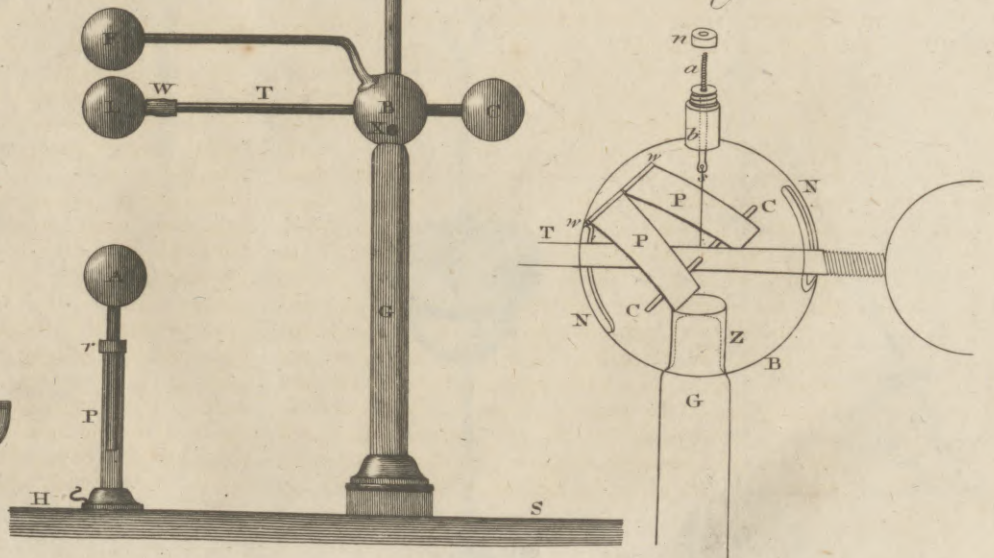


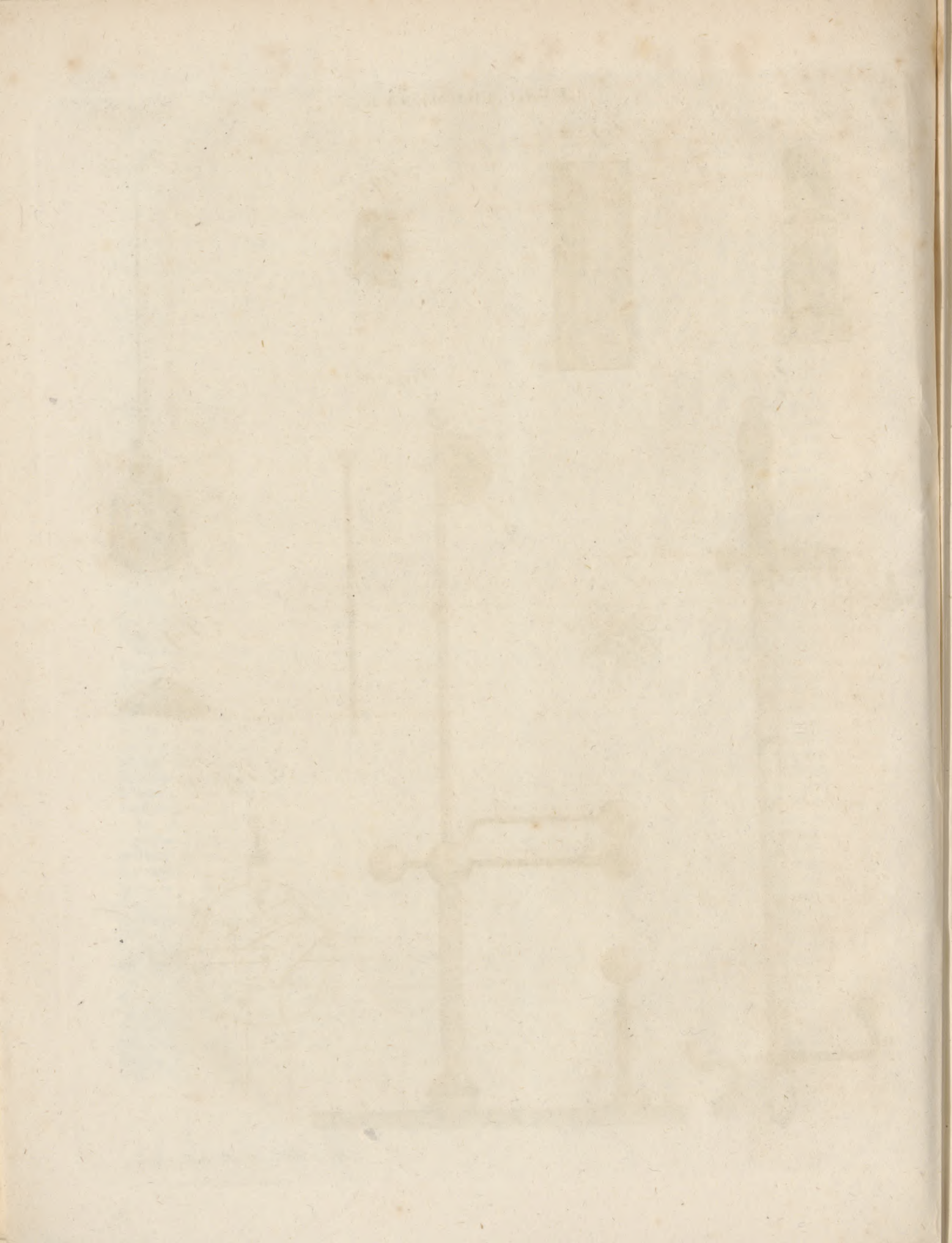
Fig. 5.



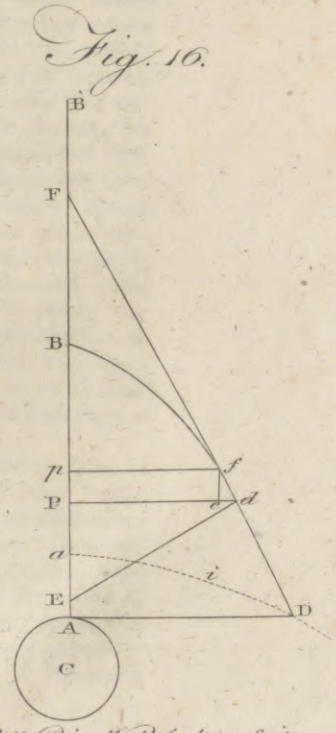
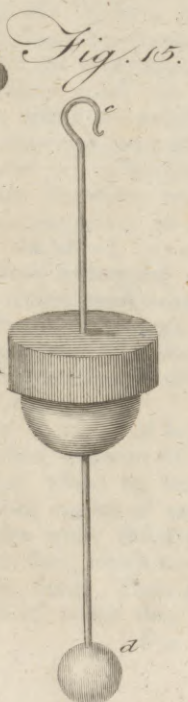
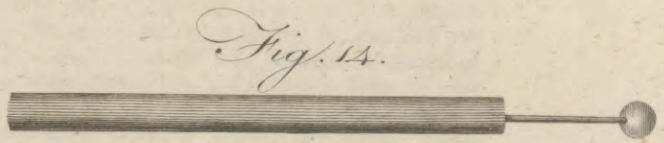
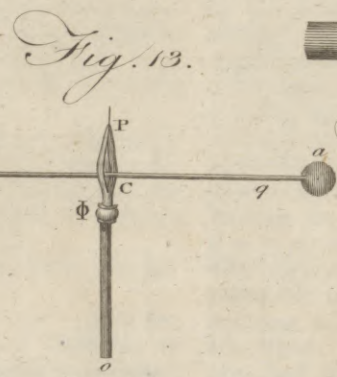
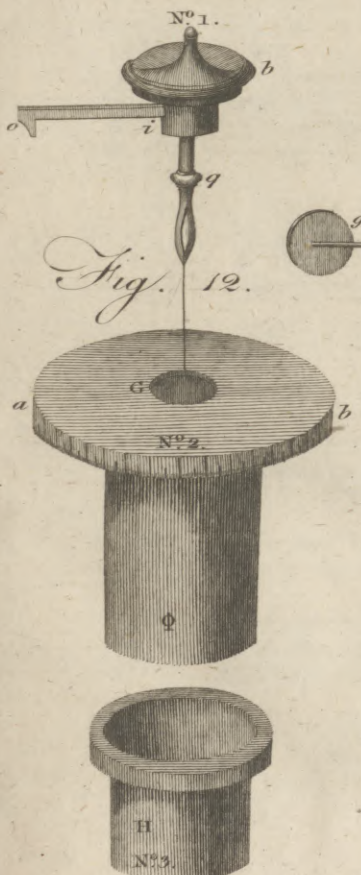
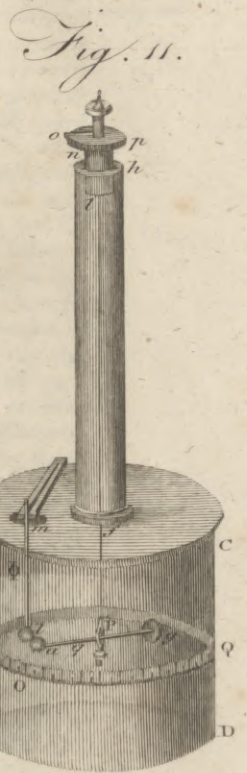
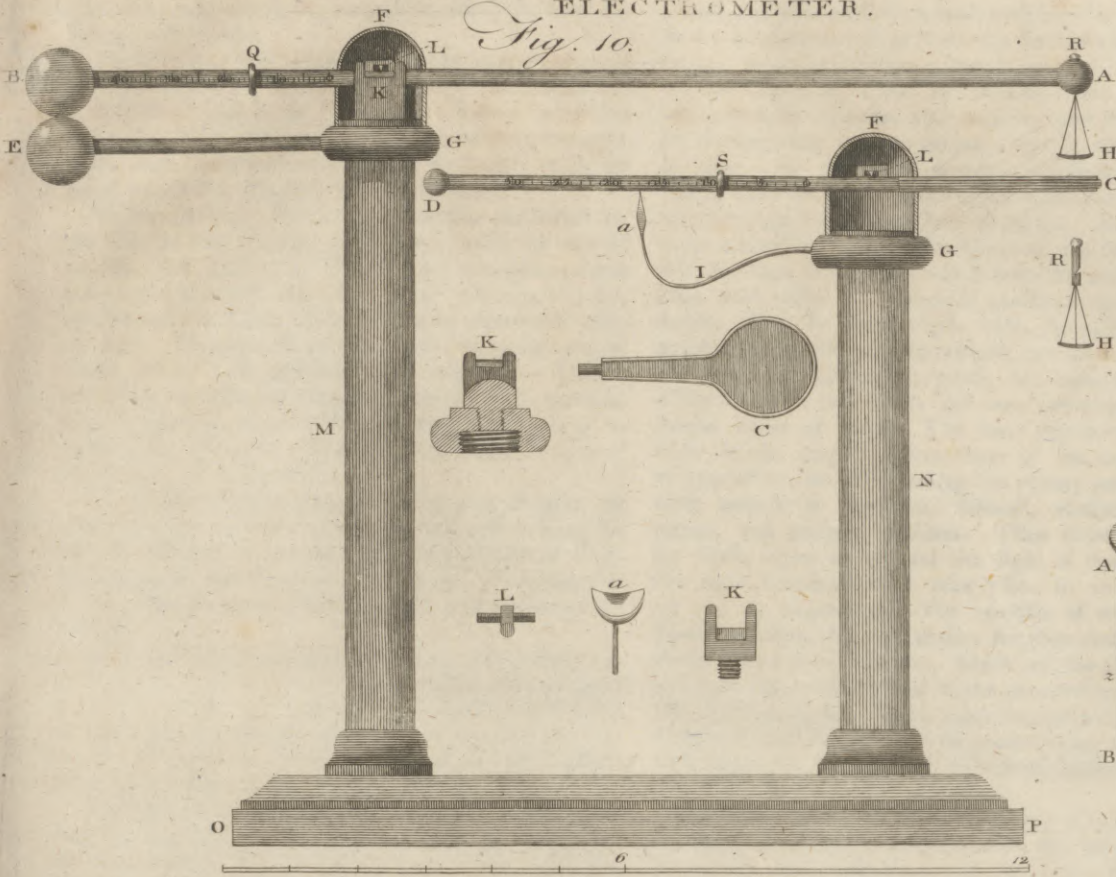
Fig. 9.



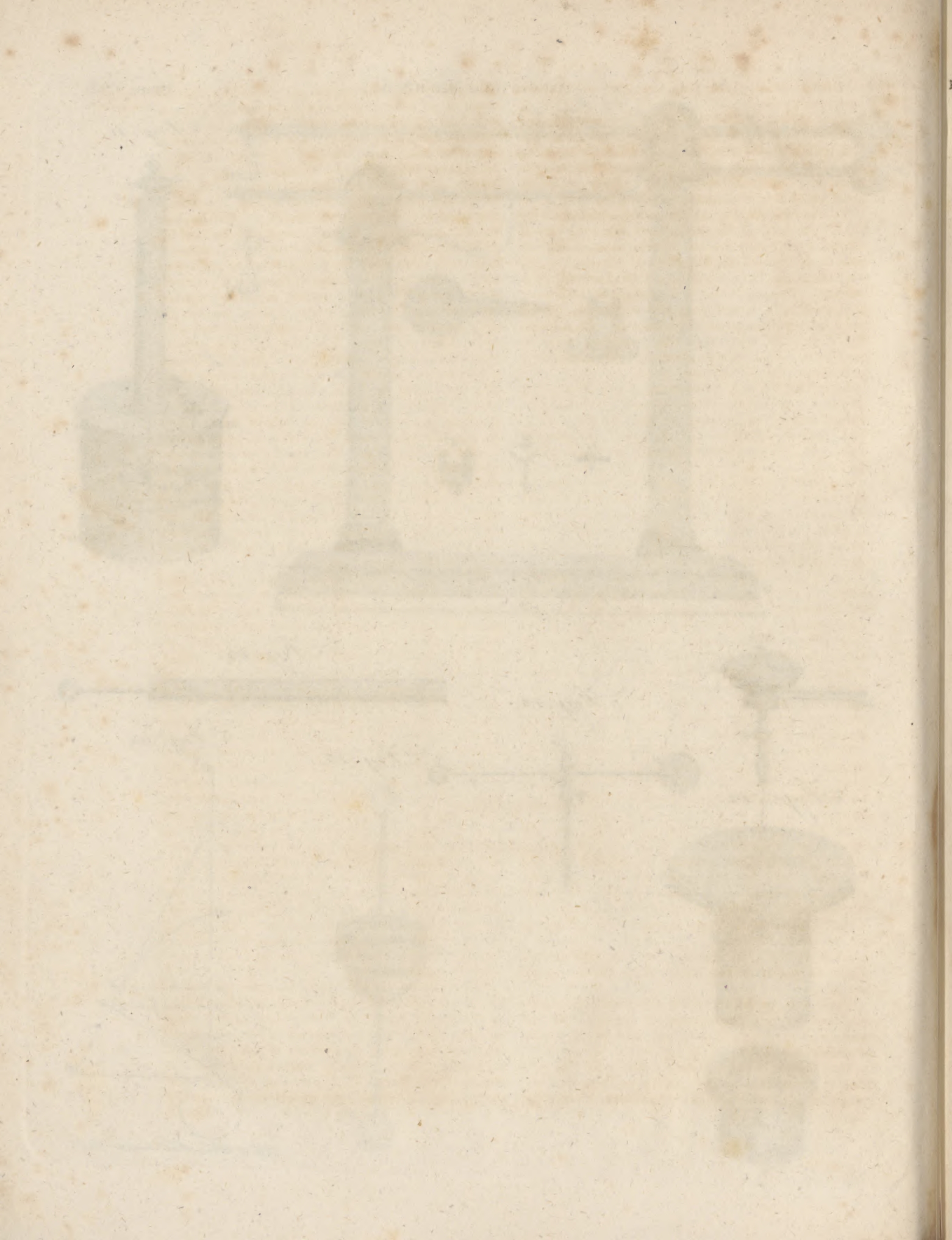
A. Bell Pin. W. al. Sculptor fecit.



ELECTROMETER.



A. Bell Pin. Wal. Sculptor. fecit.



Electrophorus || Elements. electricity was not strong enough to affect the most delicate electrometer.

ELECTROPHORUS. See *ELECTRICITY Index*.

ELECTRUM, in *Natural History*. See *AMBER*.

ELECTUARY, in *Pharmacy*, a form of medicine composed of powders and other ingredients, incorporated with some conserve, honey, or syrup; to be divided into doses, like boluses, when taken.

Vossius observes, that all the remedies prescribed for the sick, as well as the confections taken by way of regale, were called by the Greeks *ελευγματα*, and *ελευγτα*, of the verb *ελευγω*, "I like;" whence, says he, was formed the Latin *electarium*, and afterwards *electuarium*. This conjecture he supports from the laws of Sicily, where it is ordained, that *electuaries*, syrups, and other remedies, be prepared after the legal manner. The Bollandists, who relate this etymology, seem to confirm it. For the composition and different sorts of electuaries. See *PHARMACY*.

ELEEMOSYNA *Carucarum*, or *pro Aratri*, or *Aratri*, in our ancient customs, a penny which King Ethelred ordered to be paid for every plough in England towards the support of the poor. Sometimes it is also called *elemosyna regis*, because first appointed by the king.

ELEEMOSYNARIUS, in our old writers, is used for the almoner or peculiar officer who received the eleemosynary rents and gifts, and distributed them to pious and charitable uses. There was such an officer in all religious houses. The bishops also used to have their almoners, as now the king has.

ELEGANCE, (from *eligo* "I choose,") denotes a manner of doing or saying things politely, agreeably, and with choice. With choice, so as to rise above the common manners; politely, so as to strike people of delicate taste; and agreeably, so as to diffuse a relish which gratifies every body.

ELEGANCE, in oratory and composition, an ornament of politeness and agreeableness shown in any discourse, with such a choice of rich and happy expressions, as to rise politely above the common manners, so as to strike people of a delicate taste.

It is observed, that elegance, though irregular, is preferable to regularity without elegance: that is, by being so scrupulous of grammatical construction, we lose certain licences wherein the elegance of language consists.

ELEGIAC, in ancient poetry, any thing belonging to elegy. See *ELEGY*.

ELEGIT, in *Law*, a writ of execution, which lies for a person who has recovered debt or damages; or upon a recognizance in any court, against a defendant that is not able to satisfy the same in his goods.

ELEGY, a mournful and plaintive kind of poem. See the article *POETRY*.

ELEMENTS, in *Physics*, the first principles of which all bodies in the system of nature are composed.

These are supposed to be few in number, unchangeable, and by their combinations to produce that extensive variety of objects to be met with in the works of nature.

That there is in reality some foundation for this doctrine of elementary bodies is plain; for there are some principles evidently exempted from every change or

decay, and which can be mixed or changed into different forms of matter. A person who surveys the works of nature in an inattentive manner, may perhaps form a contrary opinion, when he considers the numerous tribes of fossils, plants, and animals, with the wonderful variety that appears among them in almost every instance. He may from thence be induced to conclude, that nature employs a vast variety of materials in producing such prodigious diversity. But let him inquire into the origin of this apparent diversity, and he will find that these bodies which seem the most different from each other are composed nearly of the same elements. Thus the blood, chyle, milk, urine, &c. as well as the various solid parts of animals, are all composed of one particular substance; grass, for instance, by the assistance of air and water, and even sometimes of very insipid kinds of grass. The same simplicity presents itself in the original composition of the nourishment of vegetables, notwithstanding the variety among them with respect to hardness, softness, elasticity, taste, odour, and medical qualities. They chiefly depend, for these, upon water and the light of the sun; and the same simplicity must take place in animals that are fed on vegetables. The analysis of animal substances confirms this hypothesis; for they can all be reduced into a few principles, which are the same in all, and only differ with regard to the proportions in which they are combined. With regard to animals, the case appears to be the same: and the more we are acquainted with them, the more reason we have to believe that the variety in their origin is very small.

Notwithstanding the infinite variety of natural productions, therefore, it appears, that the materials employed in their formation are but few; that these are uniformly and certainly the same, totally exempted from any change or decay; and that the constant and gradual change of one body into another is produced by the various separations and combinations of the original and elementary parts, which is plain from the regularity and uniformity of nature at all times. There is a change of forms and combinations through which it passes, and this has been the case from the earliest accounts of time; the productions of nature have always been of the same kind, and succeeded one another in the same order. If we examine an oak, for instance, we find it composed of the same matter with that of any other that has existed from the earliest ages. This regularity and uniformity in the course of nature shows that the elementary parts of bodies are permanent and unchangeable; for if these elementary particles which constituted an oak some thousand years ago, had been undergoing any gradual decay, the oaks of the present times would have been found considerably different from those that existed long ago; but as no difference has been observed, it would seem that the ultimate elements of bodies have always continued the same.

Reflections of this kind have suggested an idea of several principal elements of which all other bodies are composed, which by their various combinations furnished all the variety of natural bodies. Democritus, and other great philosophers of antiquity, fixed the number to four, which have retained the name of elements ever since. These are, fire, air, earth, and water; each of which they imagined was naturally disposed

Elements.

disposed to hold its own place in the universe. Thus, the earth, as heaviest, naturally tended towards the centre, and occupied the lower parts; the water, as approaching next to it in gravity, was spread chiefly on the outside of the earth; the air, being more subtile and rare, occupied the middle place; while the fire, being still more subtile and active, receded to the greatest distance of all, and was supposed to compose the planets and stars. This system was extended to all the productions of nature. Meteors were produced from a combination of fire and air; animals were considered as composed of earth and water; and those that were warm had likewise a proportion of the element of fire. Thus they went on, explaining some of the most striking qualities of the several productions of nature from the different proportions of the four elements they contained.

But though this system appears not at all destitute of beauty and propriety, and on this account has been long received, we know from modern discoveries that these four substances are not really elementary bodies; nor do they answer our purpose in forming a system, as we know too little of the intimate structure and texture of them to enable us to explain other bodies by them.

Any other attempts that have been made to assign the number of elementary bodies have been much less fortunate. The older chemists, with Paracelsus at their head, pretend to speak of four elementary bodies, salt, sulphur, earth, and mercury: but when we attempt to form an idea of what they mean, we find it very perplexed; and that the expressions concerning them are enveloped in so much obscurity, that they cannot be comprehended; and the theory is built entirely upon experiments made on metallic substances.

Attempts have been made by some to show that the elements, whatever they are, must necessarily be invisible or imperceptible by any of our senses. An inquiry into their number or properties therefore must be attended with very little success; and all the knowledge we can have upon the subject must be drawn from a view of their combinations, and reasoning analogically from the transmutations we observe to take place in nature. The modern discoveries in aerology have enabled us to proceed farther in this way than what it was possible for the ancient philosophers to do. We now find that all the different kinds of air are composed of that invisible and subtile fluid named *heat*, united in a certain way with some other substance: by which union the compound acquires the properties of gravitation, expansion, rarefaction, &c. for pure heat, unless when united with some terrestrial substance, neither gravitates nor expands. This is evident from the phenomena of the burning glass, where the light concentrated in the focus will neither heat the air nor water, unless it meets with something with which it can form a permanent union. Heat therefore is justly to be considered as one of the original elements; being always capable of uniting with bodies, and of being extricated from them unchanged; while the same bodies are by their union with it changed into various forms; water, for instance, into ice or vapour, both of which return into their original state by the abstraction or addition of heat in a certain degree. Hence it becomes almost natural to conclude, that there are only two elements in the universe; and this opinion we find adopted by fe-

Elements.

veral philosophers, particularly the count de Treffan in his Essay on the Electric Fluid. According to this doctrine, two primitive material substances seem to exist in nature; one that incessantly acts, and to which it is essential to be in motion; the other absolutely passive, and whose nature it is to be inert, and move entirely as directed by the former. Should this doctrine be adopted, little difficulty would occur in determining the active matter to be that universal fluid which in its various modifications of light, heat, and electricity, has such a share in the operations of nature. But in fixing on the passive element we are greatly embarrassed; nor are the discoveries in aerology or any other science as yet able to remove the difficulty entirely. According to the doctrines which long prevailed among chemical philosophers, there are three things that seem to be unchangeable, viz. earth; phlogiston; and that invisible, though terrestrial and gravitating principle, called by the antiphlogistians the *oxygenous* or acidifying principle, and by the phlogistians the basis of dephlogisticated air. In our experiments, say they, on the first, we find that earth, though vitrified by the most intense fire, may be recovered in its proper form: and some very pure earths, particularly magnesia alba, cannot be changed even in the focus of the most powerful mirror. In like manner we may dissipate charcoal *in vacuo* by the solar rays, and the compound is inflammable air: we may decompose this compound by a metallic calx, and we have our charcoal again unchanged, for all metals contain charcoal in substance. Let us try to destroy it by common fire, and we have it then in the fixed air produced, from which it may be recovered unchanged by means of the electric spark. With the basis of dephlogisticated air the case is still more difficult; for we cannot by any means procure a sight of it by itself. We may combine it with heat, and we have dephlogisticated air; to the compound we may add charcoal, and we have fixed air: by decomposing the former by burning iron in it, we have the metal greatly increased in weight by some unknown substance: and if we attempt to separate the latter, we have water, or some kind of vapour which still conceals it from our view.

In some experiments which were made by the ingenious Mr Watt, it was found that nitrous acid might be phlogisticated by the purest earth or metallic calx; whence, according to this doctrine, it is not unreasonable to suppose that phlogiston may be only a certain modification of earth, and not an element distinct from it: but with regard to the basis of dephlogisticated air, no experiment has ever shown that it can either be procured by itself, or changed into any other substance; so that it appears to have the nature of an element as much as light or heat. Though we should therefore be inclined to divide the whole matter of the universe into two classes, the one active and the other acted upon, we must allow that the passive matter even on this earth is not precisely of the same kind: much less are we to extend our speculations in this respect to the celestial regions; for who can determine whether the substance of the moon is the same with that of our earth, or that the elements of Jupiter are the same with those of Saturn? There is even a difficulty with regard to the division which seems so well established, viz. of matter in general into active

Element
||
Elephanta.

active and passive; for no person can prove, that the matter which is active in one case may not be passive in another, and occasionally resume its activity. Something like this certainly happens in the case of the electric fluid, which is modified into heat or light, according to different circumstances; and we cannot know but it is the very same substance that constitutes the most solid bodies. This opinion at least did not seem absurd to Sir Isaac Newton, who proposed it as a query, Whether gross bodies and light were not convertible into one another? The end of our inquiries on this subject therefore must be, That the universe may be composed of many elements, or of one element; and of the nature of these elements, or of the single one, we know nothing.

ELEMENT, in a figurative sense, is used for the principles and foundations of any art or science; as Euclid's Elements, &c.

ELEMENTS, in *Astronomy*, are those principles deduced from astronomical observations and calculations, and those fundamental numbers which are employed in the construction of tables of the planetary motions. Thus, the elements of the theory of the sun, or rather of the earth, are his mean motion and eccentricity, and the motion of the aphelia. The elements of the theory of the moon are its mean motion; that of its node and apogee, its eccentricity, the inclination of its orbit to the plane of the ecliptic, &c.

ELEMI, or ELEM, in the *Materia Medica*. See AMYRIS.

ELENCHUS, in antiquity, a kind of ear-rings set with large pearls.

ELENCHUS, in *Logic*, by the Latins called *argumentum* and *inquisitio*, is a vicious or fallacious argument, which deceives under the appearance of a truth; the same with what is otherwise called *sophism*.

ELEPHANT. See ELEPHAS, MAMMALIA Index.

American ELEPHANT: An animal only known in a fossil state, and that but partially, from the teeth, some of the jaw-bones, the thigh-bones, and vertebræ, found with many others five or six feet beneath the surface on the banks of the Ohio. But these bones differ in several respects from those of the elephant; for which, see *Fossil BONES*. As yet the living animal has evaded our search. Mr Pennant thinks it "more than probable, that it still exists in some of those remote parts of the vast new continent unpenetrated yet by Europeans. Providence maintains and continues every created species; and we have as much assurance that no race of animals will any more cease while the earth remains, than *seed-time and harvest, cold and heat, summer and winter, day or night*." See MAMMUTH.

ELEPHANT-Beetle. See SCARABÆUS.

Knights of the ELEPHANT, an order of knighthood in Denmark, conferred upon none but persons of the first quality and merit. It is also called the *order of St Mary*. Its institution is said to have been owing to a gentleman among the Danish croises having killed an elephant, in an expedition against the Saracens, in 1184; in memory of which, King Canutus instituted this order, the badge of which is a towered elephant, with an image of the holy virgin encircled with rays, and hung on a watered sky-coloured ribbon, like the George in England.

ELEPHANTA, a small, but very remarkable

island, about five miles from the castle of Bombay in the East Indies. Of this we have the following description in Mr Grose's Voyage to the East Indies. "It can at most be but about three miles in compass, and consists of almost all hill: at the foot of which, as you land, you see, just above the shore, on your right, an elephant, coarsely cut out in stone, of the natural bigness, and at some little distance not impossible to be taken for a real elephant, from the stone being naturally of the colour of that beast. It stands on a platform of stones of the same colour. On the back of this elephant was placed, standing, another young one, appearing to have been all of the same stone, but has been long broken down. Of the meaning, or history, of this image, there is no tradition old enough to give any account. Returning then to the foot of the hill, you ascend an easy slant, which about half way up the hill brings you to the opening or portal of a large cavern hewn out of a solid rock into a magnificent temple: for such surely it may be termed, considering the immense workmanship of such an excavation; and seems to me a far more bold attempt than that of the pyramids of Egypt. There is a fair entrance into this subterraneous temple, which is an oblong square, in length about 80 or 90 feet, by 40 broad. The roof is nothing but the rock cut flat at top, and in which I could not discern any thing that did not show it to be all of one piece. It is about 10 feet high, and supported towards the middle, at equidistance from the sides and from one another, with two regular rows of pillars of a singular order. They are very massive, short in proportion to their thickness, and their capital bears some resemblance to a round cushion pressed by the superincumbent mountain, with which they are also of one piece. At the further end of this temple are three gigantic figures; the face of one of them is at least five feet in length, and of a proportionable breadth. But these representations have no reference or connection either to any known history or the mythology of the Gentoos. They had continued in a tolerable state of preservation and wholeness, considering the remoteness of their antiquity, until the arrival of the Portuguese, who made themselves masters of the place; and in the blind fury of their bigotry, not suffering any idols but their own, they must have even been at some pains to maim and deface them, as they now remain, considering the hardness of the stone. It is said they even brought field-pieces to the demolition of images, which so greatly deserved to be spared for the unequalled curiosity of them. Of this Queen Catherine of Portugal was, it seems, so sensible, that she could not conceive that any traveller would return from that side of India without visiting the wonders of this cavern; of which too the sight appeared to me to exceed all the descriptions I had heard of them. About two-thirds of the way up this temple, on each side, and fronting each other, are two doors or outlets into smaller grots or excavations, and freely open to the air. Near and about the door-way, on the right hand, are several mutilated images, single and in groups. In one of the last, I remarked a kind of resemblance to the story of Solomon dividing the child, there standing a figure with a drawn sword, holding in one hand an infant with the head downwards, which it appears in act to cleave through the middle. The

Elephanta.

outlet

Elephant-
asis
||
Eleave.

outlet of the other on the left hand is into an area of about 20 feet in length and 12 in breadth; at the upper end of which, as you turn to the right, presents itself a colonnade covered at top, of 10 or 12 feet deep, and in length answering to the breadth of the area: this joins to an apartment of the most regular architecture, an oblong square, with a door in perfect symmetry; and the whole executed in quite a contrary taste and manner from any of the oldest or best Gentoo buildings anywhere extant. I took particular notice of some paintings round the cornices, not for any thing curious in the design, but for the beauty and freshness of the colouring, which must have lasted some thousands of years, on supposing it, as there is all reason to suppose it, cotemporary with the building itself. The floor of the apartment is generally full of water, its pavement or ground-work not permitting it to be drawn off or to be soaked up. For it is to be observed, that even the cavern itself is not visitable after the rains until the ground of it has had time to dry into a competent hardness."

ELEPHANTIASIS, called also the *lepra of the Arabians*, in *Medicine*, a chronical disease, one of the two species of leprosy which affects the whole body, where even the bones as well as the skin are covered with spots and tumours, which being red at last turn black. See *MEDICINE Index*.

ELEPHANTINE, or **ELEPHANTIS**, in *Ancient Geography*, an island in the Nile to the south of Syene; with a cognominal town, where the navigation on the Nile ends, because just below the less cataract. And here to the west of the Nile stood the last Roman garrison (*Notitia Imperii*).

ELEPHANTINE, in Roman antiquity, an appellation given to the books wherein were registered the transactions of the senate and magistrates of Rome, of the emperors or generals of armies, and even of the provincial magistrates; the births and classes of the people and other things relating to the census.

They are supposed to have been so called, as being made of leaves of ivory or elephants tusks.

ELEPHANTOMACHI. See *ETHIOPIA*.

ELEPHANTOPUS, a genus of plants belonging to the syngenesia class, and in the natural method ranking under the 49th order, *Compositæ*. See *BOTANY Index*.

ELEPHAS, the **ELEPHANT**, a genus of quadrupeds belonging to the order of bruta. See *MAMMALIA Index*.

ELEVATION, the same with **ALTITUDE** or height.

ELEVATION of the Host, in the church of Rome, that part of the mass where the priest raises the host above his head for the people to adore.

ELEVATOR, in *Anatomy*, the name of several muscles, so called from their serving to raise the parts of the body to which they belong.

ELEVATORY, in *Surgery*, an instrument for raising depressed or fractured parts of the skull, to be applied after the integuments and periosteum are removed. See *SURGERY*.

ELEVE, a term purely French, though of late used also in our language. Literally it signifies a disciple or scholar bred up under any one, being formed from the Italian *allievo*, an "apprentice" or "novice."

It was first used by the French writers in speaking of painters; such a painter was an *eleve* of Da Vinci, of Raphael, &c. From painting it came to be applied to such as studied or learned any other art under a master. In the Royal Academy of Sciences, there were 20 *eleves*: and in that of inscriptions, 10 *eleves*. The *eleves* are to act in concert with the pensionaries. See *ACADEMY*.

Eleventh,
Eleusinia.

The denomination *eleve*, however, has been since suppressed, and that of *adjoint* substituted in its room; because every body did not know the sense affixed to it by the academy: and now the pensionary academists have not, as formerly, each of them an *eleve*; but the *eleves* are become adjoints, or associates of the academy.

ELEVENTH, or chord of the eleventh. See *INTERVAL*.

ELEUSINIA, in Grecian antiquity, a festival kept in honour of Ceres, every fourth year by some states, but by others every fifth. The Athenians celebrated it at Eleusis, a town of Attica: whence the name.

Ceres, says an Athenian orator (Isocrates), wandering in quest of her daughter Proserpine, came into Attica, where some good offices were done her, which it is unlawful for those who are not initiated to hear. In return she conferred two unparalleled benefits; to wit, the knowledge of agriculture, by which the human race is raised above the brute creation; and the mysteries, from which the partakers derive sweeter hopes than other men enjoy, both as to the present life and to eternity. It was the popular opinion, that the Eleusinian goddesses suggested prudent counsel to their votaries, and influenced their conduct; that these were respected in the infernal regions, and had precedence in the assemblies of the blessed; while the unhallowed were in utter darkness, wallowing in mire, or labouring to fill a leaky vessel. The Athenians were solicitous to secure these advantages to their children, by having them initiated as soon as was allowed.

Ceres was supposed to be particularly partial to Eleusis and its vicinity. There were the memorials of her presence and of her bounty; the well named *Callichorus*, by which she had rested, in the reign of Erechtheus; the stone on which she sat, named *the sorrowful*; the Rharian plain, where barley was first sown; and the threshing-floor and altar of Triptolemus, a herdsman whom she instructed in the culture of that grain, the use of which succeeded to acorns. Her mysteries continued to possess a pre-eminence in holiness, and to be accounted as much superior to all other religious festivals as the gods were to the heroes. Even the garments worn at the solemnity were supposed to partake of their efficacy, and to be endued with signal virtues. It was usual to retain them until they were perishing; and then to dedicate them in the temple, or to reserve them for the purpose of enwrapping newborn children.

The mystic temple, as it was called, provided by Pericles for the solemnity, created such awe by its sanctity as could be equalled only by the effect of its beauty and magnitude, which excited astonishment in every beholder. The profane or uninitiated were forbidden to enter it on any pretence. Two young Arcarnanians happened inadvertently to mix with the crowd

Eleusinia. crowd at the season of the mysteries, and to go in; but the question suggested by their ignorance presently betrayed them, and their intrusion was punished with death. The chief priest, hierophant, or mystagogue, was taken from the Eumolpidae, a holy family flourishing at Athens, and descended from Eumolpus, a shepherd and favourite of Ceres. He was enjoined celibacy, and wore a stole or long garment, his hair, and a wreath of myrtle. The grand requisite, in his character were strength and melody of voice, solemnity of deportment, magnificence, and great decorum. Under him, besides many of inferior station, was the daduchus or torch-bearer, who had likewise his hair, with a fillet; the priest, who officiated at the altar; and the hieroceryx or sacred herald; all very important personages. The latter was of a family which claimed the god Mercury and Aglauros the daughter of Cecrops for its ancestors.

The secrecy in which the mysteries were enveloped, served to enhance the idea of their consequence, and to increase the desire of participation. It was so particular, that no person was allowed even to name the hierophant by whom he had been initiated. Public abhorrence and detestation awaited the babbler, and the law directed he should die.

The Athenians suffered none to be initiated into these mysteries but such as were members of their city. This regulation, which compelled Hercules, Castor, and Pollux, to become citizens of Athens, was strictly observed in the first ages of the institution, but afterwards all persons, barbarians excepted, were freely initiated.

The festivals were divided into great and less mysteries. The less were instituted from the following circumstance. Hercules passed near Eleusis while the Athenians were celebrating the mysteries, and desired to be initiated. As this could not be done, because he was a stranger, and as Eumolpus was unwilling to displease him on account of his great power, and the services which he had done to the Athenians, another festival was instituted without violating the laws. It was called μικρα, and Hercules was solemnly admitted to the celebration and initiated. These less mysteries were observed at Agræ near the Ilissus. The greater were celebrated at Eleusis, from which place Ceres has been called *Eleusinia*. In later times the smaller festivals were preparatory to the greater, and no person could be initiated at Eleusis without a previous purification at Agræ. This purification they performed by keeping themselves pure, chaste, and unpolluted, during nine days; after which they came and offered sacrifices and prayers, wearing garlands of flowers, called ισμερα or ιμμερα, and having under their feet Διός κωδιον, *Jupiter's skin*, which was the skin of a victim offered to that god. The person who assisted was called υδρανός from υδωρ *water*, which was used at the purification, and they themselves were called μυσται, *the initiated*.

A year after the initiation at the less mysteries they sacrificed a sow to Ceres, and were admitted in the greater, and the secrets of the festivals were solemnly revealed to them, from which they were called εφοροι and εποπται, *inspectors*.

This festival was observed in the month Boedromion or September, and continued nine days from the

15th till the 23d. During that time it was unlawful to arrest any man, or present any petition, on pain of forfeiting a thousand drachmas, or according to others on pain of death. It was also unlawful for those who were initiated to sit upon the cover of a well, to eat beans, mullets, or weazels. If any woman rode to Eleusis in a chariot, she was obliged by an edict of Lycurgus to pay 6000 drachmas. The design of this law was to destroy all distinction between the richer and poorer sort of citizens. When the season approached, the mystæ or persons who had been initiated only in the lesser mysteries, repaired to Eleusis to be instructed in the ceremonial. The service for the opening of the temple, with morning sacrifice, was performed. The ritual was then produced from the sanctuary. It was enveloped in symbolical figures of animals, which suggested words compendiously, in letters with ligatures, implicated, the tops huddled together, or disposed circularly like a wheel; the whole utterly inexplicable to the profane. The case, which was called *petroma*, consisted of two stones exactly fitted.

The mysterious record was replaced after the reading, and closed up until a future festival. The principal rite was nocturnal, and confined to the temple and its environs. The mystæ waited without, with impatience and apprehension. Lamentations and strange noises were heard. It thundered. Flashes of light and of fire rendered the deep succeeding darkness more terrible. They were beaten, and perceived not the hand. They beheld frightful apparitions, monsters, and phantoms of a canine form. They were filled with terror, became perplexed and unable to stir. The scene then suddenly changed to brilliant and agreeable. The propylæa or vestibules of the temple were opened, the curtains withdrawn, the hidden things displayed. They were introduced by the hierophant and daduchus, and the former showed them the mysteries. The splendor of illumination, the glory of the temple and of the images, the singing and dancing which accompanied the exhibition, all contributed to soothe the mind after its late agitation, and to render the wondering devotee tranquil and self-satisfied. After this inspection, or, as it was called, the *autopsia*, they retired, and others advanced. The succeeding days were employed in purification, in sacrifice, in pompous processions, and spectacles, at which they assisted, wearing myrtle crowns. The second day was called αλαδι μυσται, *to the sea, you that are initiated*; because they were commanded to purify themselves by bathing in the sea. On the third day sacrifices, and chiefly a mullet, were offered; as also barley from a field of Eleusis. These oblations were called Θυα, and held so sacred that the priests themselves were not, as in other sacrifices, permitted to partake of them. On the fourth day they made a solemn procession, in which the *καλαδιον*, *holy basket of Ceres*, was carried about in a consecrated cart, while on every side the people shouted *χαιροι Δακτυλε, Hail, Ceres!* After these followed women, called *μισοφοροι*, who carried baskets, in which was sesamin, carded wool, grains of salt, a serpent, pomegranates, reeds, ivy boughs, certain cakes, &c. The fifth was called *ἡ των λαμπάδων ἡμέρα*, *the torch day*; because on the following night the people ran about with torches in their hands. It was usual to dedicate torches to Ceres, and contend which should offer the biggest,

Eleufinia. biggest, in commemoration of the travels of the goddesses, and of her lighting a torch in the flames of Mount Ætna. The sixth day was called *Ιακχος*, from Iacchus, the son of Jupiter and Ceres, who accompanied his mother in her search after Proserpine with a torch in his hand. From that circumstance his statue had a torch in his hand, and was carried in solemn procession from the Ceramicus to Eleufis. The statue with those that accompanied it, called *Ιακχυαγωγον*, was crowned with myrtle. In the way nothing was heard but singing and the noise of brazen kettles as the votaries danced along. The way through which they issued from the city was called *Ἱερα οδος*, the sacred way, the resting place *Ἱερα συκη*, from a *fig-tree* which grew in the neighbourhood. They also stopped on a bridge over the Cephissus, where they derided those that passed by. After they had passed this bridge, they entered Eleufis by a place called *μυσικη εισοδος*, the mystical entrance. On the seventh day were sports, in which the victors were rewarded with a measure of barley, as that grain had been first sown in Eleufis. The eighth day was called *Επιδαυριαν ημερα*, because once Æsculapius at his return from Epidaurus to Athens was initiated by the repetition of the less mysteries. It became customary therefore to celebrate them a second time upon this, that such as had not hitherto been initiated might be lawfully admitted. The ninth and last day of the festival was called *Πλημοχοαι*, *earthen vessels*, because it was usual to fill two such vessels with wine; one of them being placed towards the east, and the other towards the west; which, after the repetition of some mystical words, were both thrown down, and the wine being spilt on the ground, was offered as a libation.

The story of Ceres and Proserpine, the foundation of the Eleufinian mysteries, was partly local. It was both verbally delivered, and represented in allegorical show. Proserpine was gathering flowers when she was stolen by Pluto. Hence the procession of the holy basket, which was placed on a car dragged along by oxen, and followed by a train of females, some carrying the mystic chests, shouting, *Hail, Ceres!* At night a procession was made with lighted torches, to commemorate the goddesses searching for her daughter. A measure of barley, the grain which, it was believed, she had given, was the reward of the victors in the gymnastic exercises; and the transaction at the temple had a reference to the legend. A knowledge of these things and places, from which the profane were excluded, was the amount of initiation; and the mode of it, which had been devised by craft, was skilfully adapted to the reigning superstitions. The operation was forcible, and the effect in proportion. The priesthood flourished as piety increased. The dispensation was corrupt, but its tendency not malignant. It produced sanctity of manners and an attention to the social duties; desire to be as distinguished by what was deemed virtue as by silence.

Some have supposed the principal rites at this festival to have been obscene and abominable, and that from thence proceeded all the mysterious secrecy. They were carried from Eleufis to Rome in the reign of Adrian, where they were observed with the same ceremonies as before, though perhaps with more freedom and licentiousness. They lasted about 1800

years, and were at last abolished by Theodosius the Great. Eleufinia.

ELEUSIS, in *Ancient Geography*, a town in Attica, between Megara and the Piræus, celebrated for the festivals of Ceres. See the preceding article.—Those rites were finally extinguished in Greece upon the invasion of Alaric the Goth. Eleufis, on the overthrow of its goddesses and the cessation of its gainful traffic, probably became soon an obscure place, without character or riches. For some ages, however, it was not entirely forsaken, as is evident from the vast consumption of the ancient materials, and from the present remains, of which the following account is given by Dr Chandler*. “The port was small and of a circular form. The stones of one pier are seen above water, and the corresponding side may be traced. About half a mile from the shore is a long hill,” which divides the plain. In the side next the sea are traces of a theatre, and on the top are cisterns cut in the rock. In the way to it, some masses of wall and rubbish, partly ancient, are standing; with ruined churches; and beyond, a long broken aqueduct crosses to the mountains. The Christian pirates had infested the place so much, that in 1676 it was abandoned. It is now a small village at the eastern extremity of the rocky brow, on which was once a castle; and is inhabited by a few Albanian families, employed in the culture of the plain, and superintended by a Turk, who resides in an old square tower. The proprietor was Achmet Aga, the primate or principal person of Athens.

* *Travels into Greece*, p. 189.

“The mystic temple at Eleufis was planned by Ictinus, the architect of the Parthenon. Pericles was overseer of the building. It was of the Doric order; the cell so large as to admit the company of a theatre. The columns on the pavement within, and their capitals, were raised by Coræbus. Mentagenes of Xypete added the architraves and the pillars above them, which sustained the roof. Another completed the edifice. This was a temple *in antis*, or without exterior columns, which would have occupied the room required for the victims. The aspect was changed to *Prostylos* under Demetrius the Phalerean; Philo, a famous architect, erecting a portico, which gave dignity to the fabric, and rendered the entrance more commodious. The site was beneath the brow, at the east end, and encompassed by the fortrefs. Some marbles, which are uncommonly massive, and some pieces of the columns, remain on the spot. The breadth of the cell is about 150 feet; the length, including the pronaos and portico, is 216 feet; the diameter of the columns, which are fluted, 6 inches from the bottom of the shafts, is 6 feet and more than 6 inches. The temple was a decastyle, or had 10 columns in the front, which was to the east. The peribolus or inclosure, which surrounded it on the north-east and on the south side, measures 387 feet in length from north to south, and 328 feet in breadth from east to west. On the west side it joined the angles of the west end of the temple in a straight line. Between the west wall of the inclosure and temple and the wall of the citadel was a passage of 42 feet 6 inches wide, which led to the summit of a high rock at the north-west angle of the inclosure, on which are visible the traces of a temple *in antis*, in length 74 feet 6 inches from north to south, and in breadth from the east

Eleutheria. east to the wall of the citadel, to which it joined on the west, 54 feet. It was perhaps that sacred to Triptolemus. This spot commands a very extensive view of the plain and bay. About three-fourths of the cottages are within the precincts of the mystic temple, and the square tower stands on the ruined wall of the inclosure.

“ At a small distance from the north end of the inclosure is a heap of marble, consisting of fragments of the Doric and Ionic orders; remains, it is likely, of the temples of Diana Propylea and of Neptune, and of the Propyleum or gateway. Wheler saw some large stones carved with wheat-ears and bundles of poppy. Near it is the bust of a colossal statue of excellent workmanship, maimed, and the face disfigured; the breadth at the shoulders, as measured by Pococke, five feet and an half; and the basket on the head above two feet deep. It probably represented Proserpine. In the heap are two or three inscribed pedestals; and on one are a couple of torches, crossed. We saw another fixed in the same stairs, which lead up the square tower on the outside. It belonged to the statue of a lady, who was hierophant or priestess of Proserpine, and had covered the altar of the goddess with silver. A well in the village was perhaps that called Callichorus, where the women of Eleusis were accustomed to dance in honour of Ceres. A tradition prevails, that if the broken statue be removed, the fertility of the land will cease. Achmet Aga was fully possessed with this superstition, and declined permitting us to dig or measure there, until I had overcome his scruples by a present of a handsome snuff-box containing several zechins or pieces of gold.”

ELEUTHERIA, a festival celebrated at Plataea in honour of Jupiter *Eleutherius*, or “ the assertor of liberty,” by delegates from almost all the cities of Greece. Its institution originated in this: After the victory obtained by the Grecians under Pausanias over Mardonius the Persian general, in the country of Plataea, an altar and statue were erected to Jupiter *Eleutherius*, who had freed the Greeks from the tyranny of the barbarians. It was further agreed upon in a general assembly, by the advice of Aristides the Athenian, that deputies should be sent every fifth year, from the different cities of Greece, to celebrate *Eleutheria*, festivals of liberty. The Plataeans celebrated also an anniversary festival in memory of those who had lost their lives in that famous battle. The celebration was thus: At break of day a procession was made with a trumpeter at the head, sounding a signal for battle. After him followed chariots loaded with myrrh, garlands, and a black bull, and certain free young men, as no signs of servility were to appear during the solemnity, because they in whose honour the festival was instituted had died in the defence of their country. They carried libations of wine and milk in large-eared vessels, with jars of oil, and precious ointments. Last of all appeared the chief magistrate, who, though not permitted at other times to touch iron, or wear garments of any colour but white, yet appeared clad in purple, and taking a water-pot out of the city-chamber, proceeded through the middle of the town, with a sword in his hand, towards the sepulchres. There he drew water from a neighbouring spring, and washed and anointed the monuments, after which he sacrificed

VOL. VIII. Part I.

a bull upon a pile of wood, invoking Jupiter and infernal Mercury, and inviting to the entertainment the souls of those happy heroes who had perished in the defence of their country. After this he filled a bowl with wine, saying, I drink to those who lost their lives in the defence of the liberties of Greece. There was also a festival of the same name observed by the Samians in honour of the god of love. Slaves also, when they obtained their liberty, kept a holiday, which they called *Eleutheria*.

ELF, a term now almost obsolete, formerly used to denote a fairy or hobgoblin; an imaginary being, the creature of ignorance, superstition, and craft. See *FAIRY*.

ELF-Arrows, in *Natural History*, a name given to the fints anciently fashioned into arrow-heads, and still found fossil in Scotland, America, and several other parts of the world: they are believed by the vulgar to be shot by fairies, and that cattle are sometimes killed by them.

ELGIN, the capital of the county of Moray in Scotland, and formerly a bishop's see, is situated on the river Lossie, about six miles north from the Spey, in W. Long. 2. 25. N. Lat. 57. 40. Mr Pennant says, it is a good town, and has many of the houses built over piazzas; but, excepting its great cattle-fairs, has little trade. It is principally remarkable for its ecclesiastical antiquities. The cathedral, now in ruins, has been formerly a very magnificent pile. The west door is very elegant and richly ornamented. The choir is very beautiful, and has a fine and light gallery running round it; and at the east end are two rows of narrow windows in an excellent Gothic taste. The chapter-house is an octagon; the roof supported by a fine single column with neat carvings of coats of arms round the capital. There is still a great tower on each side of this cathedral; but that in the centre, with the spire and whole roof, are fallen in; and form most awful fragments, mixed with the battered monuments of knights and prelates. Boethius says, that Duncan, who was killed by Macbeth at Inverness, lies buried here. The place is also crowded with a number of modern tomb-stones.—The cathedral was founded by Andrew de Moray, in 1224, on a piece of land granted by Alexander II.; and his remains were deposited in the choir, under a tomb of blue marble, in 1244. The great tower was built principally by John Innes bishop of this see, as appears by the inscription cut on one of the great pillars: “ Hic Jacet in Xto, pater et dominus, Dominus Johannes de Innes, hujus ecclesiae Episcopus;—qui hoc notabile opus incepit et per septennium aedificavit.” Elgin is a royal borough; and gives title of earl to the family of Bruce.

ELGINSHIRE, is the middle district of the ancient county of Moray. It is bounded on the north by that branch of the German ocean called the *Moray Frith*; on the east and south-east by Banff-shire; on the south-west, by Inverness-shire; and on the west by the counties of Inverness and Nairn. It extends about 42 miles in length, and its average breadth is about 20. The southern part is rocky and mountainous, called the district of *Braemoray*, which is occupied with extensive forests. The lower parts, towards the north, are rich and fertile; but might easily be rendered more

C

productive.

EL
||
Elginshire.

Eli
Elijah.

Elginshire, productive. The principal rivers are, the *Spey*, *Findhorne*, and *Loffie*; all of which abound with salmon. It contains two royal boroughs, viz. Elgin, the county town, and Forres; and several considerable towns, as *Grantown*, *Garmouth*, *Loffiemouth*, &c. The principal seats are, *Gordon-castle*, the seat of the duke of Gordon; *Castle Grant*, the seat of Sir James Grant; *Altyre*, the seat of Colonel Cumming, &c. Morayshire abounds with many remains of antiquity; the principal of which are the magnificent cathedral of Elgin, the priory of Plufcardine near the town of Elgin, the bishop's palace at Spynie, the castles of *Lochindorb*, *Dunphail*, and the *dun* of *Relugas*, in the parish of Edenkeillie. The ancient Scottish historians, particularly Fordun and Buchanan, give accounts of the Danes landing in Moray, about 1008, when Malcolm II. marched against them, and was defeated near Forres: after this they brought over their wives and children, and were in possession of the country for some time; until they were finally expelled by that monarch, after the victories gained over them at Luncarty near Perth, at Barrie in the county of Angus, and at Mortlach in the county of Banff. There are many monuments of that nation; the most remarkable of which is *Sweno's stone* or *pillar*, on the road from Nairn and Forres, in the parish of Rafford. Except freestone, limestone, and marl, no mineral substance of value has been discovered.

unquestionably great. He did not exert his magisterial authority in the exemplary punishment of vice, and even permitted his own sons with impunity to perpetrate the most atrocious acts of impiety and debauchery. This want of firmness, to give it no worse a name, was very reprehensible in one who filled such an important office, and peculiarly so in a man who was himself a saint.

The celebrated Samson made his appearance during the administration of Eli, taking part in the management of public affairs for about twenty years, by whose astonishing deeds the independant spirit of that people was in some measure revived. The circumstances attending the death of Samson, which proved so calamitous to the nobility of the Philistines, might have induced the Jews to throw off the yoke; but they did not possess a sufficient degree of virtue and public spirit for such an exertion. Eli at this period was very far advanced in years, and, if possible, still more negligent in the discharge of his duty as a chief magistrate, allowing his two sons, Hophni and Phineas, to proceed to the most extravagant height of impiety and debauchery, whose example had a most powerful influence on the manners of the people. He was far from being unacquainted with their conduct, but he reproved them with such gentleness as was highly reprehensible, and but ill calculated to produce any change on the behaviour of his sons.

The deity was so justly offended with this deportment of Eli, that a sacred seer was commissioned to upbraid him for his ingratitude and want of resolution. Young Samuel likewise was favoured with a vision of the approaching ruin of Eli's family, which he related to the otherwise venerable old man, on being solemnly adjured not to conceal a single circumstance. When Eli heard the declaration of the young prophet, being fully convinced that his conduct had been highly reprehensible, he exclaimed, "It is the Lord; let him do what seemeth him good." Soon after this the Israelites sustained a considerable loss in attempting to procure their emancipation, carrying the ark of God into their camp to animate the people, and intimidate their enemies; but the ark was captured by the Philistines, and Hophni and Phineas were slain. This intelligence having been brought to Eli, he no sooner heard that the ark of God was taken, than he fell backwards from his seat, broke his neck, and died in the 98th year of his age.

ELIAS, the prophet, memorable for having escaped the common catastrophe of mankind; being taken up alive into heaven, in a fiery chariot, about 895 B. C. See the Bible.

ELIJAH, who is sometimes denominated Elias, was one of the most distinguished of the Jewish prophets, and surnamed the *Tijfbite*, probably from the district in which he was born. He began his prophetic office about 920 years before Christ, in the reign of wicked Ahab, by whom the Sidonian idolatry was introduced among the Israelites. The prophet was commissioned to appear before this impious prince, and threaten the country with a long drought as a punishment for his crimes. The indignation of Ahab was so great against the prophet for this prediction, that he resolved to punish him in a signal manner; but Elijah withdrew to

Parishes.	Population in 1755.	Population in 1790—1798.
1 Alves	1691	1111
Birmie	525	402
Dallas	700	888
Drainy	1174	1040
5 Duffus	1679	1800
Duthil	1785	1110
Dyke and Moy	1826	1529
Edenkeillie	1443	1800
Elgin	6306	4534
10 Forres	1993	2987
Kinlofs	1191	1031
Knockandow	1267	1500
Rafford	1313	1072
Roths	1940	1500
15 St Andrews	1132	777
Speymouth	994	1347
Spynie	865	602
18 Urquhart	1110	1050
	28,934	26,080
	26,080	
Decrease,	2854	

ELI, high priest of the Israelites, and judge over them for forty years, was descended from Itamar, a junior branch of the house of Aaron, and seems to have blended the priestly with the judicial character in the year 1156 before the commencement of the Christian æra. It appears that the Jews were in a state of subjection or vassalage to the Philistines during the greater part of Eli's administration, and, what may at first appear singular, he contributed to the degeneracy of his countrymen, although his own piety and goodness were

Elijah. a secret place from his fury, at the divine command, where he was slain in a miraculous manner. He was afterwards ordered to go to Sarepta, in the territory of Sidon, where a miraculous interposition of heaven, in the house of an indigent widow, sustained him for some time, whose son the prophet restored to life.

When the three years of famine, occasioned by the drought, were expired, the prophet was ordered to appear before the king, and exhort him to that genuine repentance which an interposition of the deity so very remarkable unquestionably demanded. He had an interview with Obadiah, the governor of the king's house, who was a religious man, and had frequently screened many from the vengeance of Jezebel the queen, at the hazard of his own life. Fired with undaunted fortitude, the prophet said to Obadiah, "Go, tell thy lord, behold Elijah is here." The good man's regard for the prophet was so great, that he was afraid to deliver this message, since he knew that Ahab had used every effort to discover the prophet's retreat. The king was informed of his coming; and the first interview was distinguished by invectives on the part of the intrepid prophet and the proud sovereign, the former giving a promise of rain on the following terms. The priests of the Sidonian gods, and an assembly of the people of Israel, were to meet on Mount Carmel, where the prophet Elijah intended to give an incontestable proof of the almighty power of the God of Israel, and the total insignificance of the Sidonian divinities. For a detailed account of this memorable experiment, we must refer our readers to the book of Kings, as an abridgement of such a beautiful narration would do it manifest injury. It produced the fullest conviction in the minds of the Israelites, that Jehovah alone was entitled to adoration; and the priests of Baal were instantaneously put to death, as the most abominable perverters of the divine law.

This was followed by abundance of rain, in answer to the devout prayers of the prophet; but his glorious triumph over idolatry so exasperated Jezebel, that she resolved to murder the prophet, to avoid whose rage he fled into the wilderness, till the deity again employed him in the honourable, but often hazardous, duties of a prophet. He afterwards foretold that Hazael should be king of Syria, Jehu king over Israel; and he appointed Elisha the son of Shaphat to be his own successor. He denounced dreadful judgements against Ahab and his wicked queen Jezebel; but those which respected the king were not executed during his life, on account of the genuine repentance which he discovered. The successor of Ahab having been confined to bed in consequence of an accident, the god of Ekron was consulted relative to his recovery, which induced the prophet to declare that he should assuredly die. The king being informed that it was Elijah who dared to send such a message, he dispatched a captain and 50 men to force him into the royal presence; but they were destroyed by fire from heaven, and a second company shared the same fate. A third company confessed the visible interference of heaven in the prophet's behalf, and the captain throwing himself on the mercy of Elijah, went with him to the king. In the royal presence he undauntedly repeated the same denunciation against the idolatrous monarch, which was very soon accom-

plished; and not long after this the holy prophet, at the divine command, divided asunder the waves of Jordan, dropped his prophetic mantle to the astonished Elisha, took the flaming chariot commissioned for his reception, and rode in majesty to heaven.

ELIQUATION, in *Chemistry*, an operation by which a more fusible substance is separated from one that is less so, by means of a heat sufficiently intense to melt the former, but not the latter. Thus an alloy of copper and lead may be separated by a heat capable of melting the latter, but not the former.

ELIS. See **ELEA**.

ELIS, in *Ancient Geography*, the capital of the district of that name in Peloponnesus, situated on the Peneus, which ran through it. It was the country of Phædo the philosopher, scholar of Socrates, and friend of Plato; who inscribes with his name the dialogue on the immortality of the soul. Pyrrho also was of this city, at the head of the sect called after him *Pyrrhonists*.

The city of Elis owed its origin to an union of small towns after the Persian war. It was not encompassed immediately with a wall; for it had the care of the temple at Olympia, and its territory was solemnly consecrated to Jupiter. To invade or not protect it was deemed impiety; and armies, if marching through, delivered up their weapons, which, on their quitting it, were restored. Amid warring states the city enjoyed repose, was resorted to by strangers, and flourished. The region round about it was called *cale* or *hollow*, from the inequalities. The country was reckoned fertile, and particularly fit for the raising of flax. This, which grew nowhere else in Greece, equalled the produce of Judæa in fineness, but was not so yellow. Elis was a school, as it were, for Olympia, which was distant 37 miles. The athletic exercises were performed there, before the more solemn trial, in a gymnasium, by which the Peneus ran. The hellanodics or prefects of the games paired the rival combatants by lot, in an area called *Plethrium* or *The Acre*. Within the wall grew lofty plane-trees; and in the court, which was called the *Xyflus*, were separate courses made for the foot-races. A smaller court was called the *Quadrangle*. The prefects, when chosen, resided for ten months in a building erected for their use, to be instructed in the duties of their office. They attended before sunrise to preside at the races; and again at noon, the time appointed for the pentathlon or five sports. The horses were trained in the agora or market-place, which was called the *Hippodrome*. In the gymnasium were altars and a cenotaph of Achilles. The women, besides other rites, beat their bosoms in honour of this hero, on a fixed day toward sunset. There also was the town-hall, in which extemporary harangues were spoken and compositions recited. It was hung round with bucklers for ornaments. A way led from it to the baths through the Street of Silence; and another to the market-place, which was planned with streets between porticoes of the Doric order adorned with altars and images. Among the temples, one had a circular peristyle or colonnade; but the image had been removed and the roof was fallen in the time of Pausanias. The theatre was ancient, as was also a temple of Bacchus, one of the deities principally adored at Elis. Minerva had a temple in the citadel, with an image of ivory and gold, made

Elisba
||
Elizabeth.

(it was said) by Phidias. At the gate leading to Olympia was the monument of a person, who was buried, as an oracle had commanded, neither within nor without the city. The structures of Elis, Dr Chandler observes, seem to have been raised with materials far less elegant and durable than the produce of the Ionian and Attic quarries. The ruins are of brick, and not considerable, consisting of pieces of ordinary wall, and an octagon building with niches, which, it is supposed, was the temple with a circular peristyle. These stand detached from each other, ranging in a vale southward from the wide bed of the river Peneus; which, by the margin, has several large stones, perhaps relics of the gymnasium. The citadel was on a hill, which has on the top some remnants of a wall.

ELISHA the prophet, famous for the miracles he performed, died about 830 B. C. See *the Bible*.

ELISION, in *Grammar*, the cutting off or suppressing a vowel at the end of a word, for the sake of sound or measure, the next word beginning with a vowel.

Elisions are pretty frequently met with in English poetry, but more frequently in the Latin, French, &c. They chiefly consist in suppressions of the *a*, *e*, and *i*, though an elision suppresses any of the other vowels.

ELIXATION, in *Pharmacy*, the extracting the virtues of ingredients by boiling or stewing.

ELIXIR, in *Medicine*, a compound tincture extracted from many efficacious ingredients. Hence the difference between a tincture and an elixir seems to be this, that a tincture is drawn from one ingredient, sometimes with an addition of another to open it and to dispose it to yield to the menstruum; whereas an elixir is a tincture extracted from several ingredients at the same time.

ELIZABETH, queen of England, daughter of Henry VIII. and Anne Boleyn, was born at Greenwich, September 7. 1553. According to the humour of the times, she was early instructed in the learned languages, first by Grindal, who died when she was about 17, and afterwards by the celebrated Roger Ascham. She acquired likewise considerable knowledge of the Italian, Spanish, and French languages. Dr Grindal was also her preceptor in divinity, which she is said to have studied with uncommon application and industry. That Elizabeth became a Protestant, and her sister Mary a Papist, was the effect of that cause which determines the religion of all mankind; namely, the opinion of those by whom they were educated: and this difference of opinion, in their tutors, is not at all surprising, when we recollect, that their father Harry was of both religions, or of neither.

But the studies of Elizabeth were not confined merely to languages and theology: she was also instructed in the political history of the ancients; and was so well skilled in music, as to sing and play "artfully and sweetly."

After the short reign of her brother Edward, our heroine being then about 20 years of age, her firebrand sister acceding to the crown, Elizabeth experienced a considerable degree of persecution, so as to be not a little apprehensive of a violent death. She was accused of nobody knows what; imprisoned; and, we are told, inhumanly treated. At last, by the interces-

sion of King Philip of Spain, she was set at liberty; which she continued to enjoy, till, on the death of her pious sister, she, on the 17th of November 1558, ascended the throne of England. Her political history as a queen, is universally known and admired*: but her attention to the government of her kingdom did not totally suspend her pursuit of learning. Ascham, in his *Schoolmaster*, tells us, that, about the year 1563, five years after her accession, she being then at Windsor, besides her perfect readiness in Latin, Italian, French, and Spanish, she read more Greek in one day than some prebendaries of that church did read Latin in a whole week, (p. 21.)—She employed Sir John Fortescue to read to her Thucydides, Xenophon, Polybius, Euripides, Æschines, and Sophocles. (*Ballad*, p. 219.)—That the Latin language was familiar to her, is evident from her speech to the university of Oxford, when she was near sixty; also from her spirited answer to the Polish ambassador in the year 1598. And that she was also skilled in the art of poetry, appears not only from the several scraps which have been preserved, but likewise from the testimony of a contemporary writer, Puttenham, in his *Art of Engl. Poetry* (a very scarce book.) These are his words:—"But, last in recital, and first in degree, is the queen, whose learned, delicate, noble muse, easily surmounteth all the rest, for sense, sweetness, or subtilty, be it in ode, elegy, epigram, or any other kind of poem," &c. In this author are to be found only a specimen of 16 verses of her English poetry. "But," says Mr Walpole, "a greater instance of her genius, and that too in Latin, was her extempore reply to an insolent prohibition delivered to her from Philip II. by his ambassador, in this tetraffic.

Te veto ne pergas bello defendere Belgas:
Quæ Dracus eripuit, nunc restituantur oportet:
Quas pater evertit, jubeo te condere cellas:
Religio papæ fac restituantur ad unguem.

"She instantly answered him, with as much spirit as she used to return his invasions;

Ad Græcas, bone rex, sient mandata kalendas."

Being earnestly pressed by a Romish priest, during his persecution, to declare her opinion concerning the real presence of Christ's body in the wafer, she answered,

Christ was the word that spake it;
He took the bread, and brake it:
And what that word did make it,
That I believe, and take it. *Fuller's Holy State.*

She gave the characters of four knights of Nottinghamshire in the following distich:

Gervase the gentle, Stanhope the stout,
Markham the lion, and Sutton the lout. *Walp. Cat.*

Coming into a grammar-school, she characterized three classic authors in his hexameter:

Perius a crab-staff; bawdy Martial; Ovid a fine wag.
Full. Worth. of Warw. 126.

Sir

Elizabeth.

Sir Walter Raleigh having wrote on a window,

Fain would I climb, yet fear I to fall;

She immediately wrote under it,

If thy heart fail thee, climb not at all.

Worth. of Devonsh. 261.

Doubtless, she was a woman of singular capacity and extraordinary acquirements: and, if we could forget the story of the Scottish Mary, and of her favourite Essex, together with the burning of a few Anabaptists; in short, could we forbear to contemplate her character through the medium of religion and morality, we might pronounce her the most illustrious of illustrious women. See further the articles ENGLAND, MARY, and SCOTLAND. She died in her palace at Richmond, the 24th of March 1602, aged 70, having reigned 44 years; and was interred in the chapel of Henry VII. in Westminster Abbey. Her successor James erected a magnificent monument to her memory.—She wrote, 1. *The Mirror, or Glass of the Sinful Soul*. This was translated out of French verse into English prose, when she was eleven years old. It was dedicated to Queen Catharine Parr. Probably it was never printed; but the dedication and preface are preserved in the *Sylloge epistolarum*, in Hearne's edition of *Livii Foro-Julienfis*, p. 161. 2. Prayers and Meditations, &c. Dedicated to her father, dated at Hatfield, 1545. Manuscript, in the royal library. 3. A Dialogue out of Xenophon, in Greek, between Hiero a King, yet some time a private person, and Simonides a Poet, as touching the life of the Prince and Private Man. First printed, from a manuscript in her majesty's own hand-writing, in the Gentleman's Magazine for 1743. 4. Two Orations of Isocrates, translated into Latin. 5. Latin Oration at Cambridge. Preserved in the king's library: also in Hollinshed's Chron. p. 1206; and in Fuller's Hist. of Cambr. p. 138. 6. Latin Oration at Oxford. See Wood's Hist. and Antiq. of Oxf. lib. i. p. 289. also in Dr Jebb's Append. to his Life of Mary Queen of Scots. 7. A comment on Plato. 8. *Boethius de consolatione philosophiæ*, translated into English anno 1593. 9. *Sallust de bello Jugurthino*, translated into English anno 1590. 10. A play of Euripides, translated into Latin, (Cat. of Royal Auth.). 11. A Prayer for the use of her fleet in the great expedition in 1596. 12. Part of Horace's Art of Poetry, translated into English anno 1598. 13. *Plutarch de curiositate*, translated into English. 14. Letters on various occasions to different persons: several speeches to her parliament; and a number of other pieces.

ELIZABETH PETROWNA, (daughter of Peter the Great), the last empress of Russia, distinguished herself by her signal clemency. She made a vow, that no person should be put to death in her reign, and she strictly observed it. The example was followed, and confirmed by law, under the august sovereign of Russia, Catharine II. Elizabeth died in 1762, in the 21st year of her reign and 52d of her age.

ELK, in *Zoology*. See CERVUS, MAMMALIA *Index*.

ELL, (*ulna*), a measure, which obtains, under different denominations, in most countries, whereby cloths, stuffs, linens, silks, &c. are usually measured; answering nearly to the yard of England, the canna of Italy, the vara of Spain, the palm of Sicily, &c.

Servius will have the ell to be the space contained between the two hands when stretched forth; but Suetonius makes it only the cubit.

The ells most frequently used with us are the English and Flemish; the former containing three feet nine inches, or one yard and a quarter; the latter only 27 inches, or three quarters of a yard; so that the ell English is to the Flemish ell as five to three. In Scotland, the ell contains $37\frac{2}{5}$ English inches.

M. Ricard, in his Treatise of Commerce, reduces the ells thus: 100 ells of Amsterdam are equal to $98\frac{1}{2}$ of Brabant, Antwerp, and Brussels; to $58\frac{1}{2}$ of England and France; to 120 of Hamburg, Francfort, Leipzig, and Cologne; 125 of Breslaw; 110 of Bergen and Drontheim; and 117 of Stockholm.

ELLIOT, the Right Honourable George Augustus, Lord Heathfield, was the youngest son of the late Sir Gilbert Elliot, Baronet, of Stobbs (A) in Roxburghshire; and was born about the year 1718. He received the first rudiments of his education under a private tutor: and at an early time of life was sent to the university of Leyden, where he made considerable progress in classical learning, and spoke with fluency and elegance the German and French languages. Being designed for a military life, he was sent from thence to the celebrated *Ecole Royale du Genie Militaire*, conducted by the great Vauban, at La Fere in Picardy; where he laid the foundation of what he so conspicuously exhibited at the defence of Gibraltar. He completed his military course on the continent by a tour, for the purpose of seeing in practice what he had studied in theory. Prussia was the model for discipline, and he continued some time as a volunteer in that service.

Mr Elliot returned in the 17th year of his age to his native country, Scotland; and was the same year, 1735, introduced by his father Sir Gilbert to Lieutenant-Colonel Peers of the 23d regiment of foot, then lying at Edinburgh, as a youth anxious to bear arms for

(A) The ancient and honourable family of Elliot of Stobbs, as well as the collateral branch of Elliot of Minto in the same county, and of Elliot of Port-Elliot in Cornwall, are originally from Normandy. Their ancestor, Mr Aliott, came over with William the Conqueror, and held a distinguished rank in his army. There is a traditionary anecdote in the family relating to an honourable distinction in their coat, which, as it corresponds with history, bears the probability of truth. When William set foot on English land, he slipped and fell on the earth. He sprang up, and exclaimed that it was a happy omen—he had embraced the country of which he was to become the lord. Upon this Aliott drew his sword, and swore by the honour of a soldier, that he would maintain, at the hazard of his blood, the right of his lord to the sovereignty of the earth which he had embraced. On the event of the conquest, King William added to the arms of Aliott, which was a baton or, on a field azure, an arm and sword as a crest, with the motto, *Per saxa, per ignes, fortiter et rectè*.

Elliot.

for his king and country. He was accordingly entered as a volunteer in that regiment, where he continued for a year or more. From the 23d regiment he went into the engineer corps at Woolwich, and made great progress in that study, until his uncle Colonel Elliot brought him in his adjutant of the second troop of horse grenadiers. With these troops he went upon service to Germany, and was with them in a variety of actions. At the battle of Dettingen he was wounded. In this regiment he bought the rank of captain and major, and afterwards purchased the lieutenant-colonelcy from Colonel Brewerton, who succeeded to his uncle. On arriving at this rank, he resigned his commission as an engineer, which he had enjoyed along with his other rank, and in which service he had been actively employed very much to the advantage of his country. He received the instructions of the famous engineer Bellidor, and made himself completely master of the science of gunnery. Had he not so disinterestedly resigned his rank in the engineer department, he would long before his death, by regular progression, have been at the head of that corps. Soon after this he was appointed aid-de camp to George II. and was distinguished for his military skill and discipline. In the year 1759, he quitted the second troop of horse grenadier guards, being selected to raise, form, and discipline, the first regiment of light horse, called after him *Elliot's*. As soon as they were raised and formed, he was appointed to the command of the cavalry in the expedition on the coasts of France, with the rank of brigadier general. After this he passed into Germany, where he was employed on the staff, and greatly distinguished himself in a variety of movements; where his regiment displayed a strictness of discipline, an activity and enterprise, which gained them signal honour: and indeed they have been the pattern regiment, both in regard to discipline and appointment, to the many light dragoon troops that have been since raised in our service. From Germany he was recalled for the purpose of being employed as second in command in the memorable expedition against the Havannah; the circumstances of which conquest are well known.

On the peace, his gallant regiment was reviewed by the king, when they presented to his majesty the standards which they had taken from the enemy. Gratiſied with their fine discipline and high character, the king asked General Elliot what mark of his favour he could bestow on his regiment equal to their merit? He answered, that his regiment would be proud if his majesty should think, that, by their services, they were entitled to the distinction of *Royals*. It was accordingly made a royal regiment, with this flattering title, "The 15th, or *King's* Royal Regiment of Light Dragoons." At the same time the king expressed a desire to confer some honour on the general himself; but the latter declared, that the honour and satisfaction of his majesty's approbation of his services was his best reward.

During the peace he was not idle. His great talents in the various branches of the military art gave him ample employment. In the year 1775, he was appointed to succeed General A'Court as commander in chief of the forces in Ireland; but did not continue long in this station, not even long enough to unpack all his trunks; for finding that interferences were

Elliot.

made by petty authority derogatory of his own, he resisted the practice with becoming spirit; and not choosing to disturb the government of the sister kingdom on a matter personal to himself, he solicited to be recalled. He accordingly was so, and appointed to the command of Gibraltar in a fortunate hour for the safety of that important fortress. The system of his life, as well as his education, peculiarly qualified him for this trust. He was perhaps the most abstemious man of the age; neither indulging himself in animal food nor wine. He never slept more than four hours at a time; so that he was up later and earlier than most other men. He so inured himself to habits of hardiness, that the things which are difficult and painful to other men, were to him his daily practice, and rendered pleasant by use. It could not be easy to starve such a man into a surrender, nor possible to surprise him. The example of the commander in chief in a besieged garrison had a most persuasive efficacy in forming the manners of the soldiery. Like him his brave followers came to regulate their lives by the most strict rules of discipline before there arose a necessity for so doing; and severe exercise, with short diet, became habitual to them by their own choice. The military system of discipline which he introduced, and the preparations which he made for his defence, were contrived with so much judgment, and executed with so much address, that he was able with a handful of men to preserve his post against an attack, the constancy of which, even without the vigour, had been sufficient to exhaust any common set of men. Collected within himself, he in no instance destroyed, by premature attacks, the labours which would cost the enemy time, patience, and expence to complete; he deliberately observed their approaches, and seized on the proper moment, with the keenest perspection, in which to make his attack with success. He never spent his ammunition in useless parade or in unimportant attacks. He never relaxed from his discipline by the appearance of security, nor hazarded the lives of his garrison by wild experiments. By a cool and temperate demeanour, he maintained his station for three years of constant investment, in which all the powers of Spain were employed. All the eyes of Europe were on this garrison; and his conduct has justly exalted him to the most elevated rank in the military annals of the day. On his return to England, the gratitude of the British senate was as forward as the public voice in giving him that distinguished mark his merit deserved. Both houses of parliament voted an unanimous address of thanks to the general. The king conferred on him the honour of Knight of the Bath, with a pension during his own and a second life of his own appointment; and on June 14. 1787, his majesty advanced him to the peerage, by the title of *Lord Heathfield, Baron Gibraltar*, permitting him to take, in addition to his family arms, the arms of the fortress he had so bravely defended, to perpetuate to futurity his noble conduct.

His lordship died on the 6th of July 1790, at his chateau at Aix-la-Chapelle, of a second stroke of the palsy, after having for some weeks preceding enjoyed tolerable good health and an unusual flow of spirits. His death happened two days before he was to have set out for Leghorn in his way to Gibraltar; of which place he was once more appointed to the defence,

Ellipomacrostyla, in the view of an approaching war.—He married Anne, daughter of Sir Francis Drake of Devonshire; and had by her (who died in 1769) Francis-Augustus, now Lord Heathfield, lieutenant-colonel of the 6th regiment of horse.

ELLIPOMACROSTYLA, an old term, in *Natural History*, from the Greek, *ελλιπης imperfect*, *μακρος long*, and *στυλος a column*; which expresses an imperfect crystal with a long column, one end of the column being affixed to some solid body, and composed of thin and slender hexangular columns, terminated by hexangular pyramids.

ELLIPOPACHYSTYLA, an old term, in *Natural History*, derived from the Greek, *ελλιπης imperfect*, *παχος thick*, and *στυλος a column*, and expresses a crystal of the imperfect kind with a thick column.

ELLIPSIS, in *Geometry*, a curve line returning into itself, and produced from the section of a cone by a plane cutting both its sides, but not parallel to the base. See *Conic Sections*.

ELLIPSIS, in *Grammar*, a figure of syntax, wherein one or more words are not expressed; and from this deficiency it has got the name *ellipsis*.

ELLIPTIC, or ELLIPTICAL, something belonging to an ellipsis.

ELLISIA, a genus of plants belonging to the pentandria class; and in the natural method ranking under the 28th order, *Lurida*. See *BOTANY Index*.

ELLYS, DR ANTHONY, who was born in 1693, and educated at Clarehall, Cambridge, after rising through many inferior degrees of dignity in the church of England, was, in 1752, promoted to the see of St David's. He died at Gloucester in 1761, and is mentioned here only for the sake of his works, which are less known than they should in the present time of novel opinions. They are, besides occasional sermons, 1. A Plea for the Sacramental Test, as a just security to the Church established, and very conducive to the welfare of the State. 2. Remarks on Hume's Essay on Miracles. 3. Tracts on the Liberty spiritual and temporal of Protestants in England, addressed to J. N. Esq; at Aix-la Chapelle; the first part of which was printed in 1763, the second in 1765. In these tracts, as the editors of them truly observe, he "discovers not only fine parts, extensive knowledge, and sound judgement, but a heart overflowing with benevolence and candour, and a most Christian temper: for he always thought a person, though on the right side of the question, with principles of persecution, to be a worse man than he that was on the wrong." This amiable and respectable writer affords in his own conduct a proof that a man may be steadily attached to a party, without wishing to encroach upon the rights of others.

ELM. See ULMUS, *BOTANY Index*.

ELMACINUS, GEORGE, author of a *History of the Saracens*, was born in Egypt towards the middle of the 13th century. His history comes down from Mahomet to the year of the Hegira 512, answering to the year of our Lord 1134; in which he sets down year by year, in a very concise manner, whatever regards the Saracen empire, intermixed with some passages relating to the eastern Christians. His abilities must have been considerable; since, though he professed Christianity, he held an office of trust near the persons of the Mahometan princes. He was son to Yafer

Al Amid, secretary to the council of war under the sultans of Egypt for 45 years; and in 1238, when his father died, succeeded him in his place. His history of the Saracens was translated from Arabic into Latin by Erpinus: and printed in these two languages in folio, at Leyden, in 1625. Erpinus died before the publication; but Golius took care of it, and added a preface. It was dedicated by Erpinus's widow to Dr Andrews, bishop of Winchester.

ELOCUTION. See ORATORY, Part III.

ELOGY, a praise or panegyric bestowed on any person or thing, in consideration of its merit. The beauty of elogy consists in an expressive brevity. Eulogiums should not have so much as one epithet, properly so called, nor two words synonymous: they should strictly adhere to truth: for extravagant and improbable elogies rather lessen the character of the person or thing they would extol.

ELOHI, ELOI, or *Elohim*, in scripture, one of the names of God. But it is to be observed, that angels, princes, great men, judges, and even false gods, are sometimes called by this name. The sequel of the discourse is what assists us in judging rightly concerning the true meaning of this word. It is the same as *Eloha*. One is the singular, the other the plural. Nevertheless *Elohim* is often construed in the singular number, particularly when the true God is spoken of: but when false gods are spoken of, it is construed rather in the plural.

ELOINED, in *Law*, signifies restrained or hindered from doing something: thus it is said, that if those within age be eloined, so that they cannot sue personally, their next friend shall sue for them.

ELONGATION, in *Astronomy*, the digression or recess of a planet from the sun, with respect to an eye placed on our earth. The term is chiefly used in speaking of Venus or Mercury, the arch of a great circle intercepted between either of these planets and the sun being called the *elongation* of that planet from the sun.

ELONGATION, in *Surgery*, is an imperfect luxation, occasioned by the stretching or lengthening of the ligaments of any part.

ELOPEMENT, in *Law*, is where a married woman departs from her husband, and cohabits with an adulterer; in which case the husband is not obliged to allow her any alimony out of her estate, nor is he chargeable for necessaries for her of any kind. However, the bare advertising a wife in the gazette, or other public paper, is not a legal notice to persons in general not to trust her; though a personal notice given by the husband to particular persons is said to be good.—An action lies, and large damages may be recovered, against a person for carrying away and detaining another man's wife.

ELOQUENCE, the art of speaking well, so as to affect and persuade. See ORATORY.

ELPHINSTON, WILLIAM, a Scotch prelate and statesman of considerable eminence, who flourished in the end of the 15th and commencement of the 16th century, was born at Glasgow in the year 1431. At the university of this city he received his education, and in the learning which distinguished that period he made extraordinary proficiency. His studies being completed, he went over to France, to make himself master of

Elocution
Elphinston.

Elphinston of the civil and canon law in the university of Paris, where he afterwards became a professor, and for the space of six years acquired considerable reputation in the discharge of his duty. On his return to Scotland, he entered into holy orders, was soon appointed official of Glasgow, and afterwards of St Andrews. He was admitted a member of the king's council; and on a misunderstanding taking place between James III. of Scotland and Louis XI. of France, his powerful mediation at the latter court, in conjunction with the bishop of Dunkeld and the earl of Buchan, effected an amicable reconciliation. As Elphinston on this occasion displayed such prudence and eloquence, the king was so grateful for his meritorious services, that he rewarded him with the see of Ross, from which he was translated to the diocese of Aberdeen about the year 1484, and also appointed to the high office of chancellor of the kingdom, which he managed with so much moderation and equity, that all parties esteemed and admired him. When the civil war broke out between James and the discontented nobility, Bishop Elphinston appears to have declined all interference with public affairs of a political nature, and confined himself to the discharge of his ministerial duties. But when James IV. ascended the throne, his abilities as a statesman were again called forth, and he was chosen ambassador to the emperor Maximilian, in order to bring about a marriage alliance between his royal master and the emperor's daughter; but she had been previously promised to another. Yet the bishop's mission was not without its salutary effects, as he was the mean of terminating an enmity which had long existed between the Dutch and Scots. This he conducted in such a masterly manner, that James never undertook any thing of importance, without first procuring the sanction of his approbation. He was equally the zealous patron of learning; and it is generally believed that the establishment of a university at Aberdeen was entirely owing to his influence with the Pope, from whom he obtained a bull for that purpose; and by his exertions was King's college undertaken and completed. He bequeathed, at the time of his decease, large sums of money for its support. He terminated his mortal career in 1514, about 83 years of age, at which advanced period his constitutional vigour was very little impaired, and all the faculties of his mind were in full force; but the serious losses at the memorable battle of Flowden had broken his heart. He wrote a history of his native country, which is among the manuscripts of Sir Thomas Fairfax, in the Bodleian library at Oxford.

EDSHEMIER, ADAM, a celebrated painter, born at Franfort on the Maine, in 1574. He was first a disciple of Philip Uffenbach, a German; but his desire of improvement carrying him to Rome, he soon became a most excellent artist in landscapes, history, and night-pieces, with small figures. His works are but few; and the great pains he bestowed in finishing them raised their prices so high, that they are hardly anywhere to be found but in the cabinets of princes. He was of a melancholy turn, and sunk under the embarrassments of his circumstances in 1610. James Ernest Thomas of Landau was his disciple; and imitated his style so nicely, that their performances are not easily distinguished.

ELSIMBURG, a port town of Sweden, in the

province of Gothland, and territory of Schonen; seated on the side of the Sound, over against Elfsinore. It was formerly a fortress belonging to the Danes; but all the fortifications were demolished in 1679, and there is only one tower of a castle which remains undemolished. It now belongs to Sweden. E. Long. 13. 20. N. Lat. 56. 2.

ELSINORE, or **ELSINOOR**, a port town of Denmark, seated on the Sound, in the isle of Zealand. E. Long. 13. 23. N. Lat. 56. 0.—It was a small village, containing a few fishermen's huts, until 1445, when it was made a staple town by Eric of Pomerania; who conferred upon the new settlers considerable immunities, and built a castle for their defence. From that period it gradually increased in size and wealth, and is now the most commercial place in Denmark next to Copenhagen. It contains about 5000 inhabitants, amongst whom are a considerable number of foreign merchants, and the consuls of the principal nations trading to the Baltic. The passage of the Sound is guarded by the fortress of Cronborg, which is situated upon the edge of a peninsular promontory, the nearest point of land from the opposite coast of Sweden. It is strongly fortified towards the shore by ditches, bastions, and regular entrenchments; and towards the sea by several batteries, mounted with 60 cannon, the largest whereof are 48 pounders. Every vessel, as it passes, lowers her top-sails, and pays a toll at Elfsinore. It is generally asserted, that this fortress guards the Sound; and that all the ships must, on account of the shoal waters and currents, steer so near the batteries as to be exposed to their fire in case of refusal. This, however, is a mistaken notion. On account indeed of the numerous and opposite currents in the Sound, the safest passage lies near the fortress; but the water in any part is of sufficient depth for vessels to keep at a distance from the batteries, and the largest ships can even sail close to the coast of Sweden. The constant discharge, however, of the toll, is not so much owing to the strength of the fortress as to a compliance with the public law of Europe. Many disputes have arisen concerning the right by which the crown of Denmark imposes such a duty. The kings of Sweden, in particular, claiming an equal title to the free passage of the Strait, were for some time exempted by treaty from paying it; but in 1720, Frederic I. agreed that all Swedish vessels should for the future be subject to the usual imposts. All vessels, beside a small duty, are rated at $1\frac{1}{2}$ per cent. of their cargoes, except the English, French, Dutch, and Swedish, which pay only one per cent; and in return the crown takes the charge of constructing light-houses, and erecting signals to mark the shoals and rocks, from the Categate to the entrance into the Baltic. The tolls of the Sound, and of the two Belts, supply an annual revenue of above 100,000l.

ELVAS, a large town, and one of the best and most important in Portugal, seated in the province of Alentejo, a few miles from the frontiers of Estremadura in Spain. It is built on a mountain, and is strongly fortified with works of free-stone. The streets of the town are handsome, and the houses neat; and there is a cistern so large, that it will hold water enough to supply the whole town six months. The water is conveyed to it by a magnificent aqueduct, three

Eluding
||
Ely.

three miles in length, sustained in some places by four or five high arches, one upon another. It was bombarded by the French and Spaniards in 1706, but without effect. It has generally a garrison of 1000 men. The king founded an academy here, in 1733, for young gentlemen. W. Long. 7. 28. N. Lat. 38. 39.

ELUDING, the act of evading or rendering a thing vain and of no effect; a dexterous getting clear, or escaping out of an affair, difficulty, embarrassment, or the like. We say, to *elude* a proposition, &c. The design of chicanery is, to *elude* the force of the laws: This doctor has not resolved the difficulty, but *eluded* it. Alexander, says the historian, in cutting the Gordian knot, either *eluded* the oracle or fulfilled it: *Ille nequiquam luctatus cum latentibus nodis, Nihil, inquit, interest, quomodo solvatur; gladioque ruptis omnibus loris, oraculi sortem vel eludit, vel implevit.*

ELVELA, a genus of plants belonging to the cryptogamia class, and order of fungi. The fungus is turbinated, or like an inverted cone. See BOTANY Index.

ELUL, in ancient chronology, the 12th month of the Jewish civil year, and the sixth of the ecclesiastical: it consisted of only 29 days, and answered pretty nearly to our August.

ELUTRIATION, in *Chemistry*, an operation performed by washing solid substances with water, stirring them well together, and hastily pouring off the liquid, while the lighter part remains suspended in it, that it may thereby be separated from the heavier part. By this operation metallic ores are separated from earth, stones, and other unmetallic particles adhering to them.

ELY, a city and bishop's see of Cambridgeshire, situated about 12 miles north of Cambridge. E. Long. 0. 51. N. Lat. 52. 24. It is a county of itself, including the territory around; and has a judge who determines all causes civil and criminal within its limits. The church hath undergone various alterations since it was first established by Etheldra, the wife of Egfride, king of Northumberland, who founded a religious house here, and planted it with virgins, and became the first abbess of it herself. The Danes entirely ruined this establishment; then Ethelwald, the 27th bishop of Winchester, rebuilt the monastery, and filled it with monks; to whom King Edgar, and many succeeding monarchs, bestowed many privileges, and great grants of land; so that this abbey became in process of time the best of any in England. Richard, the 11th abbot, wishing to free himself of the bishop of Lincoln, within whose diocese his monastery was situated, and not liking so powerful a superior, he made great interest with King Henry I. to get Ely erected into a bishoprick; and spared neither purse nor prayers to bring this about. He even brought the bishop of Lincoln to consent to it, by giving him and his successors the manors of Bugden, Biggleswade, and Spalding, which belonged to the abbey, in lieu of his jurisdiction; but he lived not to taste the sweets of his industry and ambition, he dying before his abbey was erected into a see. His successor was the first bishop of Ely: but the great privileges the bishop enjoyed were almost wholly taken away, or much restricted, by the act of parliament, 27th Henry VIII. regarding

VOL. VIII. Part I.

the restoring to the crown the ancient royalties: So, instead of being palatine of the isle of Ely, the bishop and his temporal steward were by that act declared to be from thenceforth justices of the peace in the said island. This diocese contains all Cambridgeshire, and the isle of Ely, excepting Iselham, which belongs to the see of Rochester, and 15 other parishes, that are in the diocese of Norwich; but it has a parish in Norfolk, viz. Emneth. The number of parishes in this diocese are 141, whereof 75 are impropriate. It hath but one archdeacon, viz. of Ely. It is valued in the king's books at 2134l. 18s 5d. The clergy's tenth amounting to the sum of 384l. 14s. 9½d. The bishopric is computed to be worth annually 4000l. The church is dedicated to St Ethelred. The building, as it now appears, has been the work of several of its bishops. The west parts were rebuilt by Bishop Ridal; the choir and lantern were begun by Bishop Norwold, and finished by Bishop Frodsham. This see hath given two saints and two cardinals to the church of Rome; and to the English nation nine lord chancellors, seven lord treasurers, one lord privy seal, one chancellor of the exchequer, one chancellor to the university of Oxford, two masters of the rolls, and three almoners. To this cathedral belong a bishop, a dean, an archdeacon, eight prebendaries, with vicars, lay-clerks, choristers, a schoolmaster, usher, and 28 king's scholars.

ELYMAIS, the capital city of the land of Elam, or the ancient Persia. We are told (1 Mac. vi. 1.) that Antiochus Epiphanes, having understood that there were very great treasures lodged in a temple at Elymais, determined to go and plunder it: but the citizens getting intelligence of his design, made an insurrection, forced him out of the city, and obliged him to fly. The author of the second book of Maccabees (ix. 2.) calls this city *Persepolis*, in all probability because formerly it was the capital of Persia; for it is known from other accounts, that *Persepolis* and Elymais were two very different cities, the latter situated upon the Eulæus, the former upon the Araxis.

ELYMUS, a genus of plants belonging to the triandria class, and in the natural method ranking under the fourth order, *Gramina*. See BOTANY Index.

ELYOT, SIR THOMAS, a gentleman of eminent learning in the 16th century, was educated at Oxford, travelled into foreign countries, and upon his return was introduced to court. His learning recommended him to Henry VIII. who conferred the honour of knighthood on him, and employed him in several embassies: particularly in 1532, to Rome, about the divorce of Queen Catharine, and afterwards to Charles V. about 1536. He wrote, *The Castle of Health, the Governor, Banquet of Sapience, Of the Education of Children, De rebus memorabilibus Angliæ*, and other books; and was highly esteemed by all his learned contemporaries.

ELYSIUM (ΕΛΥΣΙΟΣ), in the ancient theology, or rather mythology, a place in the *inferi* or lower world, furnished with fields, meads, agreeable woods, groves, shades, rivers, &c. whither the souls of good people were supposed to go after this life.

Orpheus, Hercules, and Æneas, were supposed to

D

hava

Elymais
||
Elygium.

Elyfium,
Elzevirs.

have defcended into Elyfium in their life time, and to have returned again; (Virg. lib. vi. ver. 638, &c.) Tibullus (lib. i. eleg. 3.) gives us fine descriptions of the Elyfian fields.

Virgil oppofes Elyfium to Tartarus; which was the place where the wicked underwent their punifhment.

*Hic locus eſt, partes ubi ſe via findit in ambas:
Dextera, quæ Ditis magni ſub mœnia tendit:
Hac iter Elyfium nobis: at læva malorum
Exercet penas, et ad impia Tartara mittit.*

He affigns Elyfium to thoſe who died for their country, to thoſe of pure lives, to truly inſpired poets, to the inventors of arts, and to all who have done good to mankind.

Some authors take the fable of Elyfium to have been borrowed from the Phœnicians; as imagining the name *Elyfium* formed from the Phœnician *על אלז*, or *עלז אלז*, or *עלז אלז*, or *עלז אלז*, “to rejoice,” or “to be in joy;” the letter *a* being only changed into *e*, as we find done in many other names; as in *Enakim* for *Anakim*, &c. On which footing, Elyfian fields ſhould ſignify the ſame thing as a place of pleaſure; or,

———— *Locos lætos, et amœna vireta
Fortunatorum nemorum, ſedeſque beatas.* VIRG.

Others derive the word from the Greek *λυω ſolve*, “I deliver, I let looſe or diſengage;” becauſe here men’s ſouls are freed or diſencumbered from the fetters of the body. Beroaldus, and Hornius (Hiſt. Philoſoph. lib. iii. cap. 2.) take the place to have derived its name from Eliza, one of the firſt perſons who came into Greece after the deluge, and the author and father of the Ætolians.

The Elyfian fields were, according to ſome, in the Fortunate Iſlands on the coaſt of Africa, in the Atlantic. Others place them in the iſland of Leuce; and, according to the authority of Virgil, they were ſituated in Italy. According to Lucian, they were near the moon; or in the centre of the earth, if we believe Plutarch. Olaus Wormius contends that it was in Sweden the Elyfian fields were placed.

ELZEVIRS, celebrated printers at Amſterdam and Leyden, who greatly adorned the republic of letters with many beautiful editions of the beſt authors of antiquity. They fell ſomewhat below the Stephenses in point of learning, as well as in their editions of Greek and Hebrew authors; but as to the choice of good books, they ſeem to have equalled, and in the neatneſs and elegance of their ſmall characters, greatly to have exceeded them. Their Virgil, Terence, and Greek Teſtament, have been reckoned their maſterpieces; and are indeed ſo very fine, that they juſtly gained them the reputation of being the beſt printers in Europe. There were five of theſe Elzevirs, namely, Lewis, Bonaventure, Abraham, Lewis, and Daniel. Lewis began to be famous at Leyden in 1595, and was remarkable for being the firſt who obſerved the diſtinction between the *v* conſonant and *u* vowel, which had been recommended by Ramus and other writers long before, but never regarded. Daniel died in 1680 or 1681; and though he left children who carried on the buſineſs, paſſes nevertheleſs for the laſt of his family who excelled in it. The Elzevirs have printed ſeveral catalogues

of their editions; but the laſt, published by Daniel, is conſiderably enlarged, and abounds with new books. It was printed at Amſterdam, 1674, in 12mo, and divided into ſeven volumes.

Emanation
||
Embalming.

EMANATION, the act of flowing or proceeding from ſome ſource or origin. Such is the emanation of light from the ſun; or that of effluvia from odorous, &c. bodies; of wiſdom from God, &c.—The word is formed of the Latin *ē* “out of,” and *manare* “to flow or ſtream.”

EMANATION is alſo uſed for the thing that proceeds, as well as the act of proceeding. The power given a judge is an emanation from the regal power; the reaſonable ſoul is an emanation from the Divinity.

EMANCIPATION, in the Roman law, the ſetting free a ſon from the ſubjection of his father; ſo that whatever moveables he acquires belong in property to him, and not to his father, as before emancipation.

Emancipation puts the ſon in a capacity of managing his own affairs, and of marrying without his father’s conſent, though a minor. Emancipation differs from manumiffion, as the latter was the act of a maſter in favour of a ſlave, whereas the former was that of a father in favour of his ſon.

There were two kinds of emancipation: the one tacit, which was by the ſon’s being promoted to ſome dignity, by his coming of age, or by his marrying; in all which caſes he became his own maſter of courſe. The other, expreſs; where the father declared before a judge, that he emancipated his ſon. In performing this, the father was firſt to ſell his ſon imaginarily to another, whom they called *pater fiduciarius*, father in truſt; of whom being bought back again by the natural father, he manumitted him before the judge by a verbal declaration.

Emancipation formerly obtained in France with regard to minors or pupils, who were hereby ſet at liberty to manage their own effects, without the advice or direction of their parents or tutors.

EMARGINATED, among botaniſts. See BOTANY *Index*.

EMASCULATION, the act of caſtrating or depriving a male of thoſe parts which characterize his ſex. See CASTRATION and EUNUCH.

EMAUS, EMMAUS, or *Annnaus*, in *Ancient Geography*, a village, 60 ſtadia to the north weſt of Jeruſalem, or about ſeven miles: it afterwards became a town, and a Roman colony, *Nicopolis*, (Jerome). Re-land has another *Emmaus* towards Lydda, 22 miles from Jeruſalem, (Itinerary); a third, near Tiberias.

EMBALMING, is the opening a dead body, taking out the inteſtines, and filling the place with odoriferous and deſiccative drugs and ſpices, to prevent its putrefying. The Egyptians excelled all other nations in the art of preſerving bodies from corruption; for ſome that they have embalmed upwards of 2000 years ago, remain whole to this day, and are often brought into other countries as great curioſities. Their manner of embalming was thus: they ſcooped the brains with an iron ſcoop out at the noiſtrils, and threw in medicaments to fill up the vacuum: they alſo took out the entrails, and having filled the body with myrrh, caſſia, and other ſpices, except frankincenſe, proper to dry up the humours, they pickled it in nitre, where it lay

Embalming lay soaking for 70 days. The body was then wrapped up in bandages of fine linen and gums, to make it stick like glue; and so was delivered to the kindred of the deceased, entire in all its features, the very hairs of the eye-lids being preserved. They used to keep the bodies of their ancestors, thus embalmed, in little houses magnificently adorned, and took great pleasure in beholding them, alive as it were, without any change in their size, features, or complexion. The Egyptians also embalmed birds, &c. The prices for embalming were different; the highest was a talent, the next 20 minæ, and so decreasing to a very small matter: but they who had not wherewithal to answer this expence, contented themselves with infusing, by means of a syringe, through the fundament, a certain liquor extracted from the cedar; and, leaving it there, wrapped up the body in salt of nitre: the oil thus preyed upon the intestines, so that when they took it out, the intestines came away with it, dried, and not in the least putrified: the body being enclosed in nitre, grew dry, and nothing remained besides the skin glued upon the bones.

The method of embalming used by the modern Egyptians, according to Maillet, is to wash the body several times with rose-water, which, he elsewhere observes, is more fragrant in that country than with us; they afterwards perfume it with incense, aloes, and a quantity of other odours, of which they are by no means sparing; and then they bury the body in a winding sheet, made partly of silk and partly of cotton, and moistened, as is supposed, with some sweet-scented water or liquid perfume, though Maillet uses only the term *moistened*; this they cover with another cloth of unmixed cotton, to which they add one of the richest suits of clothes of the deceased. The expence, he says, on these occasions, is very great, though nothing like what the genuine embalming cost in former times.

EMBARCADERO, in commerce, a Spanish term, much used along the coasts of America, particularly those on the side of the South sea. It signifies a place which serves some other considerable city farther within land, for a port or place of shipping, i. e. of embarking and disembarking commodities. Thus Calao is the embarcadero of Lima, the capital of Peru; and Arica the embarcadero of Potosi. There are some embarcaderos 40, 50, and even 60 leagues off the city which they serve in that capacity.

EMBARGO, in commerce, an arrest on ships or merchandise, by public authority; or a prohibition of state, commonly on foreign ships, in time of war, to prevent their going out of port, sometimes to prevent their coming in, and sometimes both, for a limited time.

The king may lay embargoes on ships, or employ those of his subjects, in time of danger, for the service and defence of the nation; but they must not be for the private advantage of a particular trader or company; and therefore a warrant to stay a single ship is no legal embargo. No inference can be made from embargoes which are only in war-time; and are a prohibition by advice of council, and not at prosecution of parties. If goods be laden on board, and after an embargo or restraint from the prince or state comes forth, and then the master of the ship breaks ground, or en-

deavours to sail, if any damage accrues, he must be responsible for the same; the reason is, because his freight is due, and must be paid, even though the goods be seized as contraband.

EMBARRASS, (*Embarraissement*), a French term, though now naturalized; denoting a difficulty or obstacle which perplexes or confounds a person, &c.

EMBASSADOR. See AMBASSADOR.

EMBASSY, the office or function of an AMBASSADOR.

EMBDEN, a port-town and city of Germany, capital of a county of the same name, now in possession of the king of Prussia; it is situated at the mouth of the river Ens. E. Long. 6. 45. N. Lat. 53. 50.

EMBER-WEEKS, are those wherein the *ember* or *embring days* fall.

In the laws of King Alfred, and those of Canute, those days are called *ymbren*, that is, circular days, from whence the word was probably corrupted into *ember-days*: by the canonists they are called *quatuor anni tempora*, the four cardinal seasons, on which the circle of the year turns: and hence Henshaw takes the word to have been formed, viz. by corruption from *temper* of *tempora*.

The ember-days are, the Wednesday, Friday, and Saturday, after Quadragesima Sunday, after Whitsunday, after Holy-rod day in September, and after St Lucia's day in December: which four times answer well enough to the four quarters of the year, Spring, Summer, Autumn, and Winter.

Mr Somner thinks they were originally fasts, instituted to beg God's blessing on the fruits of the earth. Agreeable to which, Skinner supposes the word *ember* taken from the ashes, *embers*, then strewed on the head.

These ember-weeks are now chiefly taken notice of, on account of the ordination of priests and deacons; because the canon appoints the Sundays next succeeding the ember-weeks, for the solemn times of ordination: Though the bishops, if they please, may ordain on any Sunday or holiday.

EMBERIZA, a genus of birds belonging to the order of passeræ. See ORNITHOLOGY *Index*.

EMBLEM, a kind of painted ænigma, which, representing some obvious history, with reflections underneath, instructs us in some moral truth or other matter of knowledge. See DEVISE, ÆNIGMA, &c.

Such is that very significant image of Scævola holding his hand in the fire; with the words, *Agere et pati fortiter Romanum est*, "To do and suffer courageously is Roman."

The word is pure Greek, formed of the verb *εμβάλειν*, "to cast in, to insert." Suetonius relates, that Tiberius made the word be erased out of the decree of the Roman senate, because borrowed from another language.

The emblem is somewhat plainer and more obvious than the ænigma.—Gale defines emblem an ingenious picture, representing one thing to the eye, and another to the understanding.

The Greeks also gave the name EMBLEMS, *εμβληματά*, to inlaid or mosaic works, and even to all kinds of ornaments of vases, moveables, garments, &c. And the Latins used *emblema* in the same sense. Accordingly, Cicero reproaching Verres with the statues and fine wrought works he had plundered from the Sicilians,

Embolismus calls the ornaments fixed thereto (and which on occasion might be separated from them) *emblemata*. Add, that Latin authors frequently compare the figures and ornaments of discourse to these *emblemata*. Thus, an ancient Latin poet praising an orator, says, that all his words were ranged like the pieces in mosaic :

*Quam lepide λέξεις compostæ, ut tessellæ omnes,
At te pavimenti, atque emblemate vermiculato.*

With us emblem ordinarily signifies no more than a painting, basso-relievo, or other representation, intended to hold forth some moral or political instruction.

What distinguishes an emblem from a devise is, that the words of an emblem have a full complete sense of themselves; nay, all the sense and signification which they have, together with the figure. But there is a yet further difference between emblem and devise: for a devise is a symbol appropriated to some person, or that expresses something which concerns him particularly; whereas an emblem is a symbol that regards all the world alike.

These differences will be more apparent, from comparing the emblem above quoted, with the devise of a candle lighted, and the words *Juvando consumor*, "I waste myself in doing good." See **DEVISE**.

EMBOLISMUS, *Εμβολισμος*, in *Chronology*, signifies "intercalation." The word is formed of *εμβαλλειν*, "to insert."

As the Greeks made use of the lunar year, which is only 354 days; in order to bring it to the solar, which is 365 years, they had every two or three years an embolism, i. e. they added a 13th lunar month every two or three years, which additional month they called *embolimus*, *εμβολιμιαος*, because inserted, or intercalated.

EMBOSSING, or **IMBOSSING**, in *Architecture* and *Sculpture*, the forming or fashioning works in relievo, whether cut with a chisel or otherwise.

Embossing is a kind of sculpture, wherein the figures stick out from the plane whereon it is cut: and according as the figures are more or less prominent, they are said to be in alto, mezzo, or basso, relievo; or high, mean, or low relief. See **ENCHASING**.

EMBOTHRIMUM, a genus of plants belonging to the tetrandria class. See **BOTANY Index**.

EMBRASURE, in *Architecture*, the enlargement made of the aperture of a door or window on the inside of the wall; its use being to give the greater play for the opening of the door or casement, or to admit the more light.

EMBROCATION, in *Surgery* and *Pharmacy*, an external kind of remedy, which consists in an irrigation of the part affected, with some proper liquor, as oils, spirits, &c. by means of a woollen or linen cloth, or a sponge, dipped in the same.

EMBROIDERY, a work in gold, or silver, or silk thread, wrought by the needle upon cloth, stuffs, or muslin, into various figures. In embroidering stuffs, the work is performed in a kind of loom; because the more the piece is stretched, the easier it is worked. As to muslin, they spread it upon a pattern ready designed; and sometimes, before it is stretched upon the pattern, it is starched, to make it more easy to handle. Embroidery on the loom is less tedious than the other, in which, while they work flowers, all the threads of the muslin, both lengthwise and breadthwise, must be

continually counted; but, on the other hand, this last Embroidery is much richer in points, and susceptible of greater variety. Cloths too much milled are scarce susceptible of this ornament, and in effect we seldom see them embroidered. The thinnest muslins are left for this purpose; and they are embroidered to the greatest perfection in Saxony; in other parts of Europe, however, they embroider very prettily, and especially in France.

There are several kinds of embroidery: as, 1. Embroidery on the stamp; where the figures are raised and rounded, having cotton or parchment put under them to support them. 2. Low embroidery; where the gold and silver lie low upon the sketch, and are stitched with silk of the same colour. 3. Guimped embroidery: this is performed either in gold or silver; they first make a sketch upon the cloth, then put on cut vellum, and afterwards sew on the gold and silver with silk thread: in this kind of embroidery they often put gold and silver cord, tinsel, and spangles. 4. Embroidery on both sides; that which appears on both sides of the stuff. 5. Plain embroidery; where the figures are flat and even, without cords, spangles, or other ornaments.

By stat. 22. Geo. II. c. 36. no foreign embroidery, or gold and silver brocade, shall be imported, upon pain of being forfeited and burnt, and penalty of 100l. for each piece. No person shall sell, or expose to sale, any foreign embroidery, gold or silver thread, lace, fringe, brocade, or make up the same into any garment, on pain of having it forfeited and burnt, and penalty of 100l. All such embroidery, &c. may be seized and burnt; and the mercer, &c. in whose custody it was found, shall forfeit 100l.

EMBRUN, or **AMBRUN**, a city of Dauphiny, in France, near the confines of Piedmont. E. Long. 6. 6. N. Lat. 44. 35.

EMBRYO, in *Physiology*, the first rudiments of an animal in the womb, before the several members are distinctly formed; after which period it is denominated a *fetus*. See **GENERATION** and **FETUS**.

EMERALD, a genus of precious stones belonging to the order of siliceous earths. The word is derived, according to some, from the French *esmarade*, and that from the Latin *smaragdus*, signifying the same thing; by others it is said to be derived from the Italian *smeraldo*, or the Arabian *somorrad*. According to Cronstedt the emerald is the softest of all the precious stones, though other naturalists place it the next after the diamond in this respect. It is perhaps the most beautiful of all the gems, and, according to Wallerius, when heated in the fire, changes its colour to a deep blue, and becomes phosphorescent; but recovers its green colour when cold. When pulverized it has a white appearance, and, with borax, melts to a very thin and colourless glass. It becomes electric by being rubbed, and some have the property of the tourmalin, viz. of being electrified by heat, and in that state attracting ashes or other light substances; though the emeralds are less powerful than the tourmalin, and after having attracted the ashes, they retain them without any signs of repulsion.

Pliny mentions twelve different kinds of these precious stones; though it appears, from the vast size of some of them, that they must have been only certain kinds of green spar, or other green stone, which at that time

Emerald. time went under the name of *emerald* among the ancients. The true emerald is found only in very small crystals, from the size of $\frac{1}{16}$ th of an inch in diameter to that of a walnut. Theophrastus, however, mentions one four cubits long and three broad; likewise an obelisk composed of only four emeralds, the whole length being 40 cubits, and the breadth from four to two.

Engestroom informs us, that the emeralds, in their rough or native state, consist of hexagonal columns mostly truncated at both ends; and that he had some in his possession, which in a gentle heat became colourless; but in a strong heat white and opaque, without any mark of fusion. Brunick distinguishes them into two classes. 1. The pale green emerald, which comes from the east and from Peru, the figure being that of an hexagonal truncated prism, and the basis a vein of white quartz. 2. The dark green emerald, which is also columnar, but very dark coloured, striped longitudinally, and has little transparency. The points are generally broken off longitudinally, though Davila mentions one resembling a blunt triangular pyramid; and in the Imperial cabinet at Vienna there is one with a five-sided pyramid. These are the emeralds which become electrical by heat; though all of them do not; and those which do so cannot be known but by actual experiment. The finest specimen of the former kind of emeralds is to be seen in the treasury of the holy chapel of Loretto, containing upwards of 100 of these precious stones great and small. A fellow to this was made by art, and both were presents to the king of Sicily, designed to represent two Mount Calvaries.

Emeralds are distinguished by the jewellers into two kinds, the oriental and occidental. The true oriental emerald is very scarce, and at present only found in the kingdom of Cambay. So great indeed is the scarcity of them, that an opinion prevailed that there are no oriental emeralds. This opinion is adopted, among others, by Mr Bruce; who informs us, that he made an excursion to the island of emeralds in the Red sea, and endeavours to show that there never were any emeralds but what came from America, and that those said to have been found in the East Indies were imported from that continent. It is probable indeed, that in former times any kind of crystal tinged of a green colour might be called an *emerald*, and hence the green cockle spar brought from Egypt may have obtained the name of *mother of emeralds*; but of late some emeralds have been brought from Cambay into Italy which greatly exceeded those of America. The best emeralds of the western continent come from Peru, and are called *oriental* by the jewellers: some are found in Europe, principally in the duchy of Silesia in Germany.

Rough EMERALDS.—Those of the first and coarsest sort, called *plafmes*, for grinding, are worth 27 shillings sterling the marc, or 8 ounces. The demi-morillons, 81. sterling per marc. Good morillons, which are only little pieces, but of fine colour, from 13l. to 15l. per marc. Emeralds, larger than morillons, and called *of the third colour or sort*, are valued at from 50l. to 60l. the marc. Emeralds, called *of the second sort*, which are in larger and finer pieces than the preceding, are worth from 65l. to 75l. per marc. Lastly, those of the first colour, otherwise called *negres cartes*, are worth from 110l. to 115 l.

EMERALDS ready cut, or polished and not cut, being of good stone, and a fine colour, are worth—

	L.	s.
Those weighing one carat, or four grains	0	10
Those of two carats	1	7
Those of three carats	2	5
Those of four carats	3	10
Those of five carats	4	10
Those of six carats	7	10
Those of seven carats	15	0
Those of eight carats	19	0
Those of nine carats	23	0
Those of ten carats	33	0

Emeralds
||
Emerfon.

To counterfeit EMERALDS: Take of natural crystal, four ounces; of red lead, four ounces; verdeggris, forty-eight grains; crocus martis, prepared with vinegar, eight grains: let the whole be finely pulverized and sifted; put this into a crucible, leaving one inch empty: lute it well, and put it into a potter's furnace, and let it stand there as long as they do their pots. When cold, break the crucible; and you will find a matter of a fine emerald colour, which, after it is cut and set in gold, will surpass in beauty an oriental emerald.

EMERSION, in *Physics*, the rising of any solid above the surface of a fluid specifically heavier than itself, into which it had been violently immersed or thrust.

It is one of the known laws of hydrostatics, that a lighter solid being forced down into a heavier fluid, immediately endeavours to emerge; and that with a force or moment equal to the excess of weight of a quantity of the fluid above that of an equal bulk of the solid. Thus, if a solid be immersed in a fluid of double its specific gravity, it will emerge again till half its bulk or body be above the surface of the fluid.

EMERSION, in *Astronomy*, is when the sun, moon, or other planet, begins to re-appear, after its having been eclipsed, or hid by the interposition of the moon, earth, or other body.

The difference of longitude is sometimes found by observing the immersions and emersions of the first of Jupiter's satellites. The immersions are observed from the time of Jupiter's being in conjunction with the sun to his opposition; and the emersions, from the opposition to the conjunction; which two intervals are usually six months a-piece, and divide the year between them. But when Jupiter is in conjunction with the sun, and 15 days before and afterwards, there is nothing to be observed; the planet, with his satellites, being then lost in the light of the sun.

EMERSON is also used when a star, before hid by the sun, as being too near him, begins to re-appear and to get out of his rays.

EMERSON, WILLIAM, an eminent mathematician, was born in June 1701, at Hurworth, a village about three miles south of Darlington; at least it is certain that he resided here from his childhood. His father Dudley Emerson was a tolerable proficient in mathematics; and without his books and instructions, perhaps his own genius (most eminently fitted from mathematical disquisitions) would have never been unfolded. He was instructed in the learned languages by a young clergyman, then curate of Hurworth, who

was

Emerson. was boarded at his father's house. In the earlier part of his life he attempted to teach a few scholars: but whether from his concise method (for he was not happy in explaining his ideas), or the warmth of his natural temper, he made no progress in his school: he therefore soon left it off; and satisfied with a moderate competence left him by his parents, he devoted himself to a studious retirement. Towards the close of the year 1781 (being sensible of his approaching dissolution), he disposed of the whole of his mathematical library to a bookseller at York; and on May 20th 1782, he died of a lingering and painful disorder at his native village, aged near 81 years.

Mr Emerson in his person was rather short, but strong and well-made, with an open countenance and ruddy complexion. He was exceedingly singular in his dress. He had but one coat, which he always wore open before, except the lower button; no waistcoat; his shirt quite the reverse of one in common use, no opening before, but buttoned close at the collar behind; a kind of flaxen wig which had not a crooked hair in it, and probably had never been tortured with a comb from the time of its being made. He always walked up to London when he had any thing to publish, revising sheet by sheet himself:—Trusting no eyes but his own, was always a favourite maxim with him. He never advanced any mathematical proposition that he had not first tried in practice, constantly making all the different parts himself on a small scale, so that his house was filled with all kinds of mechanical instruments together or disjointed. He would frequently stand up to his middle in water while fishing, a diversion he was remarkably fond of. He used to study incessantly for some time, and then for relaxation take a ramble to any pot-alehouse where he could get any body to drink with and talk to. The duke of Manchester was highly pleased with his company, and used often to come to him in the fields and accompany him home, but could never persuade him to get into a carriage. On these occasions he would sometimes exclaim, "Damn your whim-wham! I had rather walk." He was a married man; and his wife used to spin on an old-fashioned wheel, whereof a very accurate drawing is given in his mechanics. He was deeply skilled in the science of music, the theory of sounds, and the various scales both ancient and modern, but was a very poor performer.

The following is a list of Mr Emerson's works. 1. The Doctrine of Fluxions. 2. The Projection of the Sphere, orthographic, stereographic, and gnomonical. 3. The Elements of Trigonometry. 4. The Principles of Mechanics. 5. A Treatise of Navigation on the Sea. 6. A Treatise of Algebra, in two books. 7. The Arithmetic of Infinites, and the differential Method, illustrated by Examples. 8. Mechanics; or the Doctrine of Motion. 9. The Elements of Optics, in four books. 10. A System of Astronomy. 11. The Laws of Centripetal and Centrifugal Force. 12. The Mathematical Principles of Geography. 13. Tracts, 8vo. 14. Cyclomathesis; or an easy Introduction to the several branches of the Mathematics. 15. A short comment on Sir Isaac Newton's Principia; to which is added, A Defence of Sir Isaac against the objections that have been made to several Parts of his

Works. 16. A Miscellaneous Treatise, containing several Mathematical Subjects, 8vo. 1776. Emery.

EMERY, in *Natural History*, a rich iron-ore found in large masses of no determinate shape or size, extremely hard, and very heavy. It is usually of a dusky brownish red on the surface; but when broken, is of a fine bright iron-gray, but not without some tinge of redness; and is spangled all over with shining specks, which are small flakes of a foliaceous stalk, highly impregnated with iron. It is also sometimes very red, and then usually contains veins of gold. It makes no effervescence with any of the acid menstrua; and is found in the island of Guernsey, in Tuscany, and many parts of Germany.

Dr Lewis is of opinion, that some kinds of emery may contain the metal called *platina*, and on this subject has the following curious observations. "Alonso Barba mentions a substance called *chumpi*; which is a hard stone of the emery kind, participating of iron, of a gray colour shining a little, very hard to work, because it resists the fire much, found in Potosi, Chocaya, and other places, along with blackish and reddish ores that yield gold. If platina is really found in large masses, either generally or only now and then, one might reasonably expect those masses to be such as are here described.

"Of the same kind perhaps also is the mineral mentioned by several authors under the name of Spanish emery, *smiris Hispanicus*, which should seem, from the accounts given of it, to be no other than platina or its matrix. The *smiris* is said to be found in the gold mines, and its exportation prohibited; to contain films or veins of native gold; to be in great request among the alchemists; to have been sometimes used for the adulteration of gold; to stand, equally with the noble metal, cupellation, quartation, antimony, and the regal cement; and to be separable from it by amalgamation with mercury, which throws out the *smiris* and retains the gold; properties strongly characteristic of platina, and which do not belong to any known substance besides. This debasement of gold *per extractum smiridis Hispanici* is mentioned by Becher in his *Minera arena-ria*, and several times hinted at in his *Physica subterranea*. Both Becher and Stahl indeed call the substance which the gold receives from the emery an earth, whereas platina is undoubtedly a metal; but this does not at all invalidate our supposition, for they give the name of earth also to the substance which copper receives from calamine in being made into brass, which is now known to be metallic.

"From these observations I have been led to suspect, that the European emeries likewise might possibly participate of platina. If this was certain, it would account satisfactorily for the use which some of the alchemists are said to have made of emeries and other ferruginous ores; and we should no longer doubt, or wonder, that by treating gold with these kinds of minerals, they obtained a permanent augmentation; that this augmentation, though it resisted lead, antimony, aquafortis, and the regal cement, was separable, as Becher owns it was, by quicksilver; and that, when it exceeded certain limits, it rendered the gold pale and brittle.

"If emery contains platina, I imagined it might be

Emery
||
Emir.

be discoverable by boiling the powdered mineral in melted lead, and afterwards working off the lead upon a test or cupel. The experiment was made with eight ounces of the finest powder of common emery, and the same quantity of lead; which were covered with black flux to prevent the scorification of the lead, and urged with a strong fire for two or three hours. The lead became hard, rigid, of a dark colour, and a granulated texture, as if it had really imbibed some platina from the emery; but in cupellation it worked almost entirely off, leaving only a head about the size of a small pin's head, which was probably no other than silver contained in the lead.

"I repeated the experiment with some variation, thinking to obtain a more perfect resolution of the emery by vitrifying it with the lead. Two ounces of fine emery and six ounces of minium were well mixed together, and urged with a strong fire, in a close crucible, for an hour: they melted into a uniform dark brownish glass. The glass was powdered, mixed with four ounces of fixt alkaline salt and some powdered charcoal, and put into a fresh crucible, with some common salt on the surface: The fire was pretty strongly excited; but the fusion was not so perfect as could be wished, and only about two ounces of lead were found revived. This lead had suffered nearly the same change as that in the foregoing experiment; and like it, gave no appearance of platina on being cupelled.

"It seems to follow from these experiments, that the emery employed in them contained no platina; but as it is not to be supposed that all emeries are of one composition, other sorts may deserve to be submitted to the same trials. As gold is contained in some parcels of common minerals, and by no means in all the individuals of any one species; platina may possibly in like manner be found in some European ores, though there is not the least footstep of it in other parcels of the same kind of ore."

EMETICS, medicines that induce vomiting. See MATERIA MEDICA *Index*.

EMIMS, ancient inhabitants of the land of Canaan beyond Jordan, who were defeated by Chedorlaomer and his allies, Gen. xiv. 5. Moses tells us, that they were beaten in Shaveh Kirjathaim, which was in the country of Sihon conquered from the Moabites, Josh. xiii. 19.—21. The Emims were a warlike people, of a gigantic stature, great and many, and tall as the Anakims.

EMINENCE, in *Geography*, a little hillock or ascent above the level of the adjoining champaign.

EMINENCE is also a title of honour given to cardinals. The decree of the Pope, whereby it was appointed that the cardinals should be addressed under the quality of *eminence*, bears date the 10th of January 1630. They then laid aside the titles of *illustrissimi* and *reverendissimi*, which they had borne before.

The grand master of Malta is likewise addressed under the quality of *eminence*. The popes John VIII. and Gregory VII. gave the same title to the kings of France. The emperors have likewise borne it.

Eminentissimus, the superlative of *eminent*, has of late been attributed to the cardinals.

EMIR, a title of dignity among the Turks, signifying a prince.

Emissary
||
Emissarius.

This title was first given to the caliphs; but when they assumed the title of Sultans, that of emir remained to their children; as that of Cæsar among the Romans. At length the title came to be attributed to all who were judged to descend from Mahomet by his daughter Fatimah, and who wear the green turban instead of the white. The Turks make an observation, that the emirs, before their fortieth year, are men of the greatest gravity, learning, and wisdom; but after this, if they are not great fools, they discover some signs of levity and stupidity. This is interpreted by the Turks as a sort of divine impulse in token of their birth and sanctity. The Turks also call the vizirs, bashaws, or governors of provinces, by this name.

EMISSARY, in a political sense, a person employed by another to found the opinions of people, spread certain reports, or act as a spy over other people's actions.

EMISSARY Vessels, in *Anatomy*, the same with those more commonly called EXCRETORY.

EMISSION, in *Medicine*, a term used chiefly to denote the ejaculation of the semen or seed in the act of coition. See COITION and GENERATION.

EMMANUEL, or IMMANUEL, a Hebrew word which signifies 'God with us.' Isaiah (viii. 14.), in that celebrated prophecy, wherein he declares to Ahaz the birth of the Messiah, who was to be born of a virgin, says, This child shall be called, and really be, Emmanuel, that is, *God with us*. The same prophet (viii. 8.) repeats the same thing, while he is speaking of the enemy's army, which, like a torrent, was to overflow Judea. 'The stretching out of his wings shall fill the breadth of thy land, O Emmanuel.' The evangelist Matthew (i. 23.) informs us, that this prophecy was accomplished in the birth of Christ, born of the virgin Mary, in whom the two natures divine and human were united, and so in this sense he was really Emmanuel, or 'God with us.'

EMMERICK, a rich fortified town of Germany, in the circle of Westphalia, and duchy of Cleves. It carries on a good trade with the Dutch, and both Protestants and Catholics have the free exercise of their religion. The streets are neat and regular, and the houses tolerably built. It was taken by the French in 1672, and delivered to the elector of Brandenburg in 1673, under whose jurisdiction it now is. It is seated near the Rhine. E. Long. 5. 29. N. Lat. 52. 5.

EMMIUS, UBBO, born at Gretha in East Friesland in 1547, was a very learned professor, and chosen rector of the college of Norden in 1579. This seminary flourished exceedingly under his care; and declined as visibly after he was ejected, in 1587, for refusing to subscribe the Confession of Augsburg. The year after, he was made rector of the college of Leer; and when the city of Groningen confederated with the United Provinces, the magistrates appointed him rector of that college: which employment he filled with the highest repute near 20 years; until, the college being erected into an university, he was the first rector, and one of the chief ornaments of it by his lectures, till his infirmities prevented his public appearance. His wisdom was equal to his learning; so that the governor of Friesland and Groningen often consulted him, and seldom failed to follow his advice. He wrote

Vetus

Enmenagogues *Vetus Græcia illustrata*, 3 vols; *Decades Rerum Freſicorum*; and many other valuable works. He died in 1625.

EMMENAGOGUES, *Εμμηναγωγία*, in *Medicine*, ſuch remedies as promote the menſtrual diſcharge. They are thus called from *εμ* “in,” *μηνα* “month,” *αγω δuco*, “I lead,” becauſe their natural periods of flowing are once a-month.

EMOLLIENTS, in *Medicine* and *Pharmacy*, are ſuch remedies as ſheath and ſoften the aſperity of the humours, and relax and ſupple the ſolids at the ſame time.

EMOLUMENT, is properly applied to the profits ariſing daily from an office or employ. The word is formed of the Latin *emolumentum*, which, according to ſome, primarily ſignifies the profits redounding to the miller from his mill; of *molo*, *molere*, “to grind.”—The patent, or other inſtrument, whereby a perſon is preferred to an office, gives him a right to enjoy all the duties, honours, profits, and emoluments belonging thereto.—*Emolument* is alſo uſed, in a ſomewhat greater latitude, for profit or advantage in the general.

EMOTION and PASSION, in the human mind, are thus diſtinguiſhed by a celebrated writer*. An internal motion or agitation of the mind, when it paſſeth away without deſire, is denominated *an emotion*: when deſire follows, the motion or agitation is denominated *a paſſion*. A fine face, for example, raiſeth in me a pleaſant feeling: if that feeling vaniſh without producing any effect, it is in proper language an *emotion*; but if the feeling, by reiterated views of the object, becomes ſufficiently ſtrong to occaſion deſire, it loſes its name of emotion, and acquires that of *paſſion*. The ſame holds in all the other paſſions. The painful feeling raiſed in a ſpectator by a ſlight injury done to a ſtranger, being accompanied with no deſire of revenge, is termed an emotion; but that injury raiſeth in the ſtranger a ſtronger emotion, which being accompanied with deſire of revenge, is a paſſion. External expreſſions of diſtreſs produce in the ſpectator a painful feeling, which being ſometimes ſo ſlight as to paſs away without any effect, is an emotion; but if the feeling be ſo ſtrong as to prompt deſire of affording relief, it is a paſſion, and is termed *pity*. Envy is emulation in exceſs: if the exaltation of a competitor be barely diſagreeable, the painful feeling is an emotion; if it produce deſire to depreſs him, it is a paſſion. See PASSION.

EMOUY, or HIA-MEN, an iſland and port of China, under the juriſdiction of the province of FO-KIEN.

The port is properly but an anchoring-place for ſhips, incloſed on one ſide by the iſland from which it takes its name, and on the other by the main-land: but it is ſo extenſive, that it can contain ſeveral thouſands of veſſels; and the depth of its water is ſo great, that the largeſt ſhips may lie cloſe to the ſhore without danger.

In the beginning of the preſent century it was much frequented by European veſſels; but ſew viſit it at preſent, as all the trade is carried on at Canton. The emperor keeps here a gariſon of 6 or 7000 men, commanded by a Chineſe general. In entering this road, a large rock muſt be doubled which ſtands at the mouth of it, and divides it almoſt as the Mingant di-

vides the harbour of Breſt. This rock is viſible, and riſes ſeveral feet above the ſurface of the water.

The iſland of Emouy is particularly celebrated on account of the magnificence of its principal pagod, conſecrated to the deity Fo. This temple is ſituated in a plain, terminated on one ſide by the ſea, and on the other by a lofty mountain. Before it the ſea, flowing through different channels, forms a large ſheet of water which is bordered with turf of the moſt beautiful verdure. The front of this edifice is 180 feet to length, and its gate is adorned with figures in relief, which are the uſual ornaments of the Chineſe architecture. On entering, you find a vaſt portico, with an altar in the middle, on which is placed a gigantic ſtatue of gilt braſs, repreſenting the god Fo, ſitting croſs-legged. Four other ſtatues are placed at the corners of this portico, which are 18 feet high, although they repreſent people ſitting. Each of theſe ſtatues is formed from a ſingle block of ſtone. They bear in their hands different ſymbols which mark their attributes, as formerly in Athens and Rome the trident and caduceus diſtinguiſhed Neptune and Mercury. One holds a ſerpent in his arms, which is twiſted round its body in ſeveral folds; the ſecond has a bent bow and a quiver; the two others preſent, one a kind of battle-axe, and the other a guitar, or ſome inſtrument of the ſame kind.

After croſſing this portico, you enter a ſquare outer court, paved with large gray ſtones, the leaſt of which is ten feet in length and four in breadth. At the four ſides of this court ariſe four pavilions, which terminate in domes, and have a communication with one another by means of a gallery which runs quite round it. One of theſe contains a bell ten feet in diameter; the wooden-work which ſupports this heavy maſs cannot be ſufficiently admired. In the other is kept a drum of an enormous ſize, which the bonzes uſe to proclaim the days of new and full moon. It muſt be obſerved, that the clappers of the Chineſe bells are on the outſide, and made of wood in the form of a mallet. The two other pavilions contain the ornaments of the temple, and often ſerve to lodge travellers, whom the bonzes are obliged to receive. In the middle of this court is a large tower, which ſtands by itſelf, and terminates alſo in a dome, to which you aſcend by a beautiful ſtone ſtair-caſe that winds round it. This dome contains a temple remarkably neat; the ceiling is ornamented with moſaic work, and the walls are covered with ſtone figures in relief, repreſenting animals and monſters. The pillars which ſupport the roof of this edifice are of wood varniſhed; and on feſtivals are ornamented with ſmall flags of different colours. The pavement of the temple is formed of little ſhells, and its different compartments preſent birds, butterflies, flowers, &c.

The bonzes continually burn incenſe upon the altar, and keep the lamps lighted, which hang from the ceiling of the temple. At one extremity of the altar ſtands a brazen urn, which when ſtruck ſends forth a mournful ſound: on the oppoſite ſide is a hollow machine of wood, of an oval form, uſed for the ſame purpoſe, which is to accompany with its ſound their voices when they ſing in praiſe of the tutelary idol of the pagod. The god Pouſſa is placed on the middle of this altar, on a flower of gilt braſs, which ſerves as a baſe, and holds

* *Elem. of Criticiſm*, vol. i. p. 45.

Emouy,
Empale-
ment.

holds a young child in his arms; several idols, which are no doubt subaltern deities, are ranged around him, and show by their attitudes their respect and veneration.

The bonzes have traced out on the walls of this temple several hieroglyphical characters in praise of Poussa; there is also to be seen an historical or allegorical painting in fresco, which represents a burning lake, in which several men appear to be swimming, some carried by monsters, others surrounded by dragons and winged serpents. In the middle of the gulf rises a steep rock, on the top of which the god is seated, holding in his arms a child, who seems to call out to those who are in the flames of the lake; but an old man, with hanging ears and horns on his head, prevents them from climbing to the summit of the rock, and threatens to drive them back with a large club. The bonzes are at a loss what answer to give, when any questions are asked them concerning this painting. Behind the altar is a kind of library, containing books which treat of the worship of idols.

On descending from this dome you cross the court, and enter a kind of gallery, the walls of which are lined with boards; it contains 24 statues of gilt brass, representing the same number of philosophers, ancient disciples of Confucius. At the end of this gallery you find a large hall, which is the refectory of the bonzes; and after having traversed a spacious apartment, you at length enter the temple of Fo, to which there is an ascent by a large stone staircase. It is ornamented with vases full of artificial flowers (a work in which the Chinese excel); and here also are found the same kind of musical instruments as those mentioned before. The statue of the god is not to be seen but through a piece of black gauze, which forms a kind of veil or curtain before the altar. The rest of the pagod consists of several large chambers, exceedingly neat, but badly disposed; the gardens and pleasure grounds are on the declivity of the mountain; and a number of delightful grottoes are cut out in the rock, which afford an agreeable shelter from the excessive heat of the sun.

There are several other pagods in the isle of Emouy; among which is one called *The Pagod of the Ten Thousand Stones*, because it is built on the brow of a mountain where there is a like number of little rocks, under which the bonzes have formed grottoes and very pleasant covered seats. A certain rural simplicity reigns here, which captivates and delights.

Strangers are received by these bonzes with great politeness, and may freely enter their temples; but they must not attempt to gratify their curiosity fully, nor to enter those apartments into which they are not introduced, especially if they are accompanied by suspicious persons; for the bonzes, who are forbid under pain of severe punishment to have any intercourse with women, and who often keep them in private, might, from fear of being discovered, revenge themselves for too impertinent a curiosity.

EMPALEMENT, an ancient kind of punishment, which consisted in thrusting a stake up the fundament. The word comes from the French *empaler*, or the Italian *impalare*; or rather, they are all alike derived from the Latin *palus*, "a stake," and the preposition *in*, "in or into." We find mention of empaling in Ju-

VOL. VIII. Part I.

venal. It was frequently practised in the time of Nero, and continues to be so in Turkey.

EMPALEMENT of a flower, the same with CALYX.

EMPANELLING. See IMPANELLING.

EMPARLANCE. See IMPARLANCE.

EMPEDOCLES, a celebrated philosopher and poet, was born at Agrigentum, a city in Sicily. He followed the Pythagorean philosophy, and admitted the metempsychosis. He constantly appeared with a crown of gold on his head; to maintain, by this outward pomp, the reputation he had acquired of being a very extraordinary man. Yet Aristotle says, that he was a great lover of liberty, extremely averse to state and command, and that he even refused a kingdom that was offered him. His principal work was a Treatise in verse on the Nature and Principles of Things. Aristotle, Lucretius, and all the ancients, make the most magnificent elogiums on his poetry and eloquence.

He taught rhetoric; and often alleviated the anxieties of his mind, as well as the pains of his body, with music. It is reported, that his curiosity to visit the flames of the crater of *Ætna* proved fatal to him. Some maintain that he wished it to be believed that he was a god; and that his death might be unknown, he threw himself into the crater and perished in the flames. His expectations, however, were frustrated; and the volcano, by throwing up one of his sandals, discovered to the world that Empedocles had perished by fire. Others report that he lived to an extreme old age; and that he was drowned in the sea about 440 years before the Christian era.

EMPEROR, (*Imperator*), among the ancient Romans, signified a general of an army, who, for some extraordinary success, had been complimented with this appellation. Thus Augustus, having obtained no less than twenty famous victories, was as often saluted with the title *emperor*; and Titus was denominated *emperor* by his army after the reduction of Jerusalem.

Afterwards it came to denominate an absolute monarch or supreme commander of an empire. In this sense Julius Cæsar was called *emperor*: the same title descended with the dignity to Octavius Augustus, Tiberius, and Caligula; and afterwards it became elective.

In strictness, the title *emperor* does not, and cannot, add any thing to the rights of sovereignty: its effect is only to give precedence and pre-eminence above other sovereigns; and as such, it raises those invested with it to the summit of all human greatness.

It is disputed, whether or not emperors have the power of disposing of the regal title. It is true, they have sometimes taken upon them to erect kingdoms; and thus it is that Bohemia and Poland are said to have been raised to the dignity: thus also, the emperor Charles the Bald, in the year 877, gave Provence to Boson, putting the diadem on his head, and decreeing him to be called "king," *ut more principum imperatorum regibus videretur dominari*. Add, that the emperor Leopold erected the ducal Prussia into a kingdom in favour of the elector of Brandenburg; and though several of the kings of Europe refused for some time to acknowledge him in that capacity, yet by the treaty of Utrecht in 1712 they all came in.

In the east, the title and quality of emperor are more frequent than they are among us; thus, the so-

E

vereign

Empale-
ment
||
Emperor.

Emperor. Sovereign princes of China, Japan, Mogul, Persia, &c. are all emperors of China, Japan, &c. In the year 1723, the czar of Muscovy assumed the title of *emperor of all Russia*, and procured himself to be recognized as such by most of the princes and states of Europe.

In the West, the title has been a long time restrained to the emperors of Germany. The first who bore it was Charlemagne, who had the title of emperor conferred on him by Pope Leo III. though he had all the power before. The imperial prerogatives were formerly much more extensive than they are at present. At the close of the Saxon race, A. D. 1024, they exercised the right of conferring all the ecclesiastical benefices in Germany; of receiving the revenues of them during a vacancy; of succeeding to the effects of intestate ecclesiastics; of confirming or annulling the elections of the popes; of assembling councils, and of appointing them to decide concerning the affairs of the church; of conferring the title of king on their vassals; of granting vacant fiefs; of receiving the revenues of the empire; of governing Italy as its proper sovereigns; of erecting free cities, and establishing fairs in them; of assembling the diets of the empire, and fixing the time of their duration; of coining money, and conferring the same privilege on the states of the empire; and of administering both high and low justice within the territories of the different states: but in the year 1437, they were reduced to the right of conferring all dignities and titles, except the privilege of being a state of the empire; of *preces primariæ*, or of appointing once during their reign a dignitary in each chapter or religious house; of granting dispensations with respect to the age of majority; of erecting cities, and conferring the privilege of coining money; of calling the meetings of the diet, and presiding in them.

To which some have added, 1. That all the princes and states of Germany are obliged to do them homage, and swear fidelity to them. 2. That they, or their generals, have a right to command the forces of all the princes of the empire, when united together. 3. That they receive a kind of tribute from all the princes and states of the empire, for carrying on a war which concerns the whole empire, which is called the *Roman month*. For the rest, there is not a foot of land or territory annexed to his title: but ever since the reign of Charles IV. the emperors have depended entirely on their hereditary dominions as the only source of their power, and even of their subsistence. See DIET and ELECTORS.

The kings of France were anciently also called emperors, at the time when they reigned with their sons, whom they associated to the crown. Thus Hugh Capet, having associated his son Robert, took the title of emperor, and Robert that of king; under which titles they are mentioned in the History of the Council of Rheims, by Gerbert, &c. King Robert is also called emperor of the French by Helgau of Fleury. Louis le Gros, upon associating his son, did the same. In the First Register of the King's Charters, fol. 166, are found letters of Louis le Gros, dated in 1116, in favour of Raymond bishop of Maguelonne, wherein he styles himself, *Ludovicus, Dei ordinante providentia, Francorum imperator augustus*. The kings of England had likewise anciently the title of emperors, as ap-

pears from a charter of King Edgar: *Ego Edgarus Anglorum basileus, omniumque regum insularum oceani quæ Britanniam circumiacent, &c. imperator et dominus*. Empetrum
||
Empire.

EMPETRUM, BERRY-BEARING HEATH, a genus of plants belonging to the monœcia class. In the natural method this genus is ranked by Linnæus under the 54th order, *Miscellanæ*. See BOTANY INDEX.

EMPHASIS, in *Rhetoric*, a particular stress of the voice and action, laid on such parts or words of the oration as the orator wants to enforce upon his audience. See DECLAMATION; ORATORY, Part IV.; and READING.

EMPHYSEMA, in *Surgery*, a windy tumor, generally occasioned by a fracture of the ribs, and formed by the air insinuating itself, by a small wound, between the skin and muscles, into the substance of the cellular or adipose membrane, spreading itself afterwards up to the neck, head, belly, and other parts, much after the manner in which butchers blow up their veal.

EMPIRE (*imperium*), in political geography, a large extent of land, under the jurisdiction or government of an emperor. See EMPEROR.

In ancient history we read of four great monarchies or empires, viz. that of the Babylonians, Chaldeans, and Assyrians; that of the Medes and Persians; that of the Greeks; and that of the Romans. The first subsisted from the time of Nimrod, who founded it in the year of the world 1800, according to the computation of Usher, to Sardanapalus their last king in 3257, and consequently lasted above 1450 years. The empire of the Medes commenced under Arbaces, in the year of the world 3257, and was united to that of the Babylonians and Persians under Cyrus, in 3468, and it closed with the death of Darius Codomannus in 3674. The Grecian empire lasted only during the reign of Alexander the Great, beginning in the year of the world 3674, and terminating with the death of this conqueror in 3681, his conquests being divided among his captains. The Roman empire commenced with Julius Cæsar, when he was made perpetual dictator, in the year of the city 708, and of the world 3956, 48 years before Christ. The seat of the empire was removed to Byzantium by Constantine, in the year of our Lord 334; the east and west were then united under the title of the Roman empire, till the Romans proclaimed Charlemagne emperor, A. D. 800. From this epocha the east and west formed two separate empires; that of the east, governed by Greek emperors, commenced A. D. 302: and being gradually weakened, terminated under Constantine Palæologus in 1453. The western empire was afterwards known by the appellation of the empire, or German empire.

Antiquaries distinguish between the medals of the *upper*, and *lower* or *bas*, empire.—The curious only value those of the upper empire, which commences with Cæsar or Augustus, and ends in the year of Christ 260. The lower empire comprehends near 1200 years, reckoning down to the destruction of Constantinople in 1453.—They usually distinguish two ages, or periods, of the lower empire: the first beginning where the upper ends, viz. with Aurelian, and ending with Anastasius, including 200 years; the second beginning with Anastasius, and ending with the Palæologi, which includes 1000 years.

EMPIRE,

EMPIRE, or *The empire*, used absolutely and without any addition, signifies the empire of Germany: called also, in juridical acts and laws, The holy Roman empire. It had its beginning with the ninth century; Charlemagne being created first emperor by Pope Leo III. who put the crown on his head in St Peter's church on Christmas-day in the year 800.

Authors are at a loss under what form of government to range the empire. Some of them maintain it to be a monarchical state, because all the members thereof are obliged to ask the investiture of their states of the emperor, and to take an oath of fidelity to him. Others consider it as a republic, or aristocratic state, because the emperor cannot resolve or determine any thing without the concurring suffrages of the princes. It is added, that if they require investiture from, and swear fealty to him, it is only as head of the republic, and in the name of the republic, and not in his own; just as at Venice every thing is transacted in name of the doge. Others will have the empire to be a monarcho-aristocratic state, *i. e.* a mixture of monarchy and aristocracy; because, though the emperor in many cases seems to act sovereignly, yet his decrees and resolves have no force, in case the state refuse to confirm them. Lastly, it has been called an aristo-democratic state, because the diet, wherein the sovereignty is lodged, is composed of princes and the deputies of the cities; and is divided into three orders or bodies, called *colleges*, *viz.* the college of electors, the college of princes, and the college of cities.

We say, diet of the empire, circles of the empire, fiefs of the empire, princes of the empire, estates of the empire, members of the empire, capitulations of the empire. See DIET, CIRCLE, PRINCE, CAPITULATION, &c.

The states or estates of the empire are of two kinds, mediate and immediate. The immediate states are those who hold immediately of the empire: Whereof, again, there are two kinds; the first, such as have seats and voices in the imperial diet; the second, such as have none. The mediate states are those who hold of the immediate.

The states which now compose the empire are, The princes of the empire, the counts of the empire, the free barons of the empire, the prelates of the empire, the princesses or abbesses of the empire, the nobles of the empire, and the imperial cities.

EMPIRIC, an appellation given to those physicians who conduct themselves wholly by their own experience, without studying physic in a regular way. Some even use the term, in a still worse sense, for a quack who prescribes at random, without being at all acquainted with the principles of the art.

EMPIS, a genus of insects belonging to the order Diptera. See ENTOMOLOGY *Index*.

EMPLASTER. See PLASTER.

EMPORIÆ, a double city of the Hither Spain, near the Pyrenees; separated by a wall; one part occupied by the Greeks of Phocæa, whence originally are the Massilienses; the other, by native Spaniards, to whom was added by Augustus a Roman colony. Now Ampurias, in Catalonia. E. Long. 2. 50. N. Lat. 42. 15.

EMPORIUM, in *Medicine*, is often used for the common sensory in the brain. See BRAIN.

EMPORIUM, in *Ancient Geography*, two cities near Placentia; one well fortified, and guarded by a strong garrison, at which Hannibal met a repulse: the other, Hannibal took and plundered. Now thought to be Pont-Nura, in the duchy of Placentia.

EMPRESS, the spouse of an emperor, or a woman who governs an empire. See EMPEROR.

EMPROSTHOTONOS, a species of convulsion, wherein the head bends forward.

EMPYÆMA, in *Medicine*, a disorder wherein purulent matter is contained in the thorax or breast, after an inflammation and suppuration of the lungs and pleura. See MEDICINE *Index*.

EMPYREAL AIR. So Dr Higgins denominates that which Dr Priestley calls *d-phlogisticated* air, and other philosophers *vital* or *pure* air.

EMPYREUM, a term used by divines for the highest heaven, where the blessed enjoy the beatific vision. The word is formed of $\epsilon\upsilon$ and $\pi\upsilon\rho$; *fire*; because of its splendour.

EMPYREUMA, in *Chemistry*, signifies a very disagreeable smell produced from burnt oils. It is often perceived in distillations of animal as well as vegetable substances, when they are exposed to a quick fire.

EMRODS. See HEMORRHOIDS.

EMULATION, a generous ardour kindled by the praise-worthy examples of others, which impels us to imitate, to rival, and, if possible, to excel them. This passion involves in it esteem of the person whose attainments or conduct we emulate, of the qualities and actions in which we emulate him, and a desire of resemblance, together with a joy springing from the hope of success. The word comes originally from the Greek $\alpha\mu\upsilon\lambda\alpha$, *dispute, contest*; whence the Latin, *emulus*, and thence our *emulation*.

Plato observes of emulation, that it is the daughter of envy; if so, there is a great difference between the mother and the offspring; the one is a virtue and the other a vice. Emulation admires great actions, and strives to imitate them; envy refuses them the praises that are their due; emulation is generous, and only thinks of surpassing a rival; envy is low, and only seeks to lessen him. Perhaps, therefore, it would be more just to suppose emulation the daughter of admiration: admiration, however, is a principal ingredient in the composition of it.

EMULGENT, or RENAL, ARTERIES, those which supply the kidneys with blood; being sometimes single, sometimes double, on each side. See ANATOMY *Index*.

EMULSION, a soft liquid remedy, of a colour and consistence resembling milk. See PHARMACY.

EMUNCTORY, in *Anatomy*, a general term for all those parts which serve to carry off the excrementitious parts of the blood and other humours of the body. Such more especially are the kidneys, bladder, and most of the glands.

ENALLAGE, in *Grammar*, is when one word is substituted for another of the same part of speech: A substantive for an adjective; as *exercitus victor*, for *victoriosus*; *scelus*, for, *scelestus*: A primitive for a derivative; as *Dardana arma*, for *Dardania*: An active for a passive; as *nox humida celo præcipitat*, for *præcipitatur*, &c.

ENAMEL, in general, is a vitrified matter betwixt

Enamel-
ing.Enamel-
ing.

the parts of which is dispersed some unvitriified matter : hence enamel ought to have all the properties of glass except transparency.

Enamels have for their basis a pure crystal glass or frit, ground up with a fine calx of lead and tin prepared for the purpose, with the addition usually of white salt of tartar. These ingredients baked together are the matter of all enamels, which are made by adding colours of this or that kind in powder to this matter, and melting or incorporating them together in a furnace.

For white enamel, Neri (*De Arte Vitriar.*) directs only manganese to be added to the matter which constitutes the basis. For azure, zaffer mixed with calx of brass. For green, calx of brass with scales of iron, or with crocus martis. For black, zaffer with manganese or with crocus martis; or manganese with tartar. For red, manganese, or calx of copper and red tartar. For purple, manganese with calx of brass. For yellow, tartar and manganese. And for violet-coloured enamel, manganese with thrice-calcined brass.

In making these enamels, the following general cautions are necessary to be observed. 1. That the pots must be glazed with white glass, and must be such as will bear the fire. 2. That the matter of enamels must be very nicely mixed with the colours. 3. When the enamel is good, and the colour well incorporated, it must be taken from the fire with a pair of tongs. 4. The general way of making the coloured enamel is this: Powder, sift, and grind, all the colours very nicely, and first mix them with one another, and then with the common matter of enamels: then set them in pots in a furnace; and when they are well mixed and incorporated, cast them into water; and when dry, set them in a furnace again to melt; and when melted, take a proof of it. If too deep-coloured, add more of the common matter of enamels; and if too pale, add more of the colours.

Enamels are used either in counterfeiting or imitating precious stones, in painting in enamel; or by enamellers, jewellers, and goldsmiths, in gold, silver, and other metals. The two first kinds are usually prepared by the workmen themselves, who are employed in these arts. That used by jewellers, &c. is brought to us chiefly from Venice or Holland, in little cakes of different sizes, commonly about four inches diameter, having the mark of the maker struck upon it with a puncheon. It pays 1s. 7 $\frac{4}{10}$ d. the pound on importation, and draws back 1s. 5 $\frac{7}{10}$ d. at the rate of 4s. per pound.

ENAMELLING, the art of laying enamel upon metals, as gold, silver, copper, &c. and of melting it at the fire, or of making divers curious works in it at a lamp. It signifies also to paint in enamel.

The method of painting in ENAMEL. This is performed on plates of gold or silver, and most commonly of copper, enamelled with the white enamel; whereon they paint with colours which are melted in the fire, where they take a brightness and lustre like that of glass. This painting is the most prized of all for its peculiar brightness and vivacity, which is very permanent, the force of its colours not being effaced or sullied with time as in other painting, and continuing always as fresh as when it came out of the workmen's hands. It is usual in miniature; it being the more

difficult the larger it is, by reason of certain accidents it is liable to in the operation. Enamelling should only be practised on plates of gold, the other metals being less pure: copper, for instance, scales with the application, and yields fumes; and silver turns the yellow white. Nor must the plate be made flat; for in such case, the enamel cracks; to avoid which, they usually forge them a little round or oval, and not too thick. The plate being well and evenly forged, they usually begin the operation by laying on a couch of white enamel (as we observed above) on both sides, which prevents the metal from swelling and blistering; and this first layer serves for the ground of all the other colours. The plate being thus prepared, they begin at first by drawing out exactly the subject to be painted with red vitriol, mixed with oil of spike, marking all parts of the design very lightly with a small pencil. After this, the colours (which are to be before ground with water in a mortar of agate extremely fine, and mixed with oil of spike somewhat thick) are to be laid on, observing the mixtures and colours that agree to the different parts of the subject; for which it is necessary to understand painting in miniature. But here the workman must be very cautious of the good or bad qualities of the oil of spike he employs to mix his colours with, for it is very subject to adulterations.

Great care must likewise be taken, that the least dust imaginable come not to your colours while you are either painting or grinding them; for the least speck, when it is worked up with it, and when the work comes to be put into the reverberatory to be made red hot, will leave a hole, and so deface the work.

When the colours are all laid, the painting must be gently dried over a slow fire to evaporate the oil, and the colours afterwards melted to incorporate them with the enamel, making the plate red-hot in a fire like what the enamellers use. Afterwards that part of the painting must be passed over again which the fire hath any thing effaced, strengthening the shades and colours, and committing it again to the fire, observing the same method as before, which is to be repeated till the work be finished.

Method of ENAMELLING by the Lamp. Most enamelled works are wrought at the fire of a lamp, in which, instead of oil, they put melted horse-grease, which they call *caballine oil*. The lamp, which is of copper, or white iron, consists of two pieces; in one of which is a kind of oval plate, six inches long, and two high, in which they put the oil and the cotton. The other part, called the *box*, in which the lamp is inclosed, serves only to receive the oil which boils over by the force of the fire. This lamp, or, where several artists work together, two or three more lamps are placed on a table of proper height. Under the table, about the middle of its height, is a double pair of organ-bellows, which one of the workmen moves up and down with his foot to quicken the flame of the lamps, which are by this means excited to an incredible degree of vehemence. Grooves made with a gauge in the upper part of the table, and covered with parchment, convey the wind of the bellows to a pipe of glass before each lamp; and that the enamellers may not be incommoded with the heat of the lamp, every pipe is covered at six inches distance with a little tin plate, fixed into the table by a wooden handle. When the works do not require a long blast,

Enamel-
ling
||
Encaustic
Painting.

blast, they only use a glass pipe, into which they blow with their mouth.

It is incredible to what a degree of fineness and delicacy the threads of enamel may be drawn at the lamp. Those which are used in making false tufts of feathers are so fine, that they may be wound on the reel like silk or thread. The fictitious jets of all colours, used in embroideries, are also made of enamel; and that with so much art, that every small piece hath its hole to pass the thread through wherewith it is sewed. These holes are made by blowing them into long pieces; which they afterwards cut with a proper tool.

It is seldom that the Venetian or Dutch enamels are used alone: they commonly melt them in an iron ladle, with an equal part of glass or crystal; and when the two matters are in perfect fusion, they draw it out into threads of different sizes, according to the nature of the work. They take it out of the ladle while liquid, with two pieces of broken tobacco-pipes, which they extend from each other at arm's length. If the thread is required still longer, then another workman holds one end, and continues to draw it out, while the first holds the enamel to the flame. Those threads, when cold, are cut into what lengths the workman thinks fit, but commonly from 10 to 12 inches: and as they are all round, if they are required to be flat, they must be drawn through a pair of pinchers while yet hot. They have also another iron instrument in form of pinchers, to draw out the enamel by the lamp when it is to be worked and disposed in figures. Lastly, they have glass tubes of various sizes, serving to blow the enamel into various figures, and preserve the necessary vacancies therein; as also to spare the stuff, and form the contours. When the enameller is at work, he sits before the lamp with his foot on the step that moves on the bellows; and holding in his left hand the work to be enamelled, or the brass or iron wires the figures are to be formed on, he directs with his right the enamel thread, which he holds to the flame with a management and patience equally surprising. There are few things they cannot make or represent with enamel: and some figures are as well finished, as if done by the most skilful carvers.

ENARTHROSIS, in *Anatomy*, a species of **DYARTHROSIS**.

ENCÆNIA, the name of three several festivals celebrated by the Jews in memory of the dedication, or rather purification, of the temple, by Judas Maccabæus, Solomon, and Zorobabel. This term is likewise used in church history for the dedication of Christian churches.

ENCAMPMENT, the pitching of a **CAMP**.

ENCANTHIS, in *Surgery*, a tubercle arising either from the caruncula lachrymalis, or from the adjacent red skin; sometimes so large, as to obstruct not only the puncta lachrymalia, but also part of the sight or pupil itself. See **SURGERY**.

ENCAUSTIC and **ENCAUSTUM**, the same with enamelling and enamel. See **ENAMELLING** and **ENAMEL**.

Encaustic Painting, a method of painting made use of by the ancients, in which wax was employed to give a gloss to their colours, and to preserve them from the injuries of the air.

Encaustic
Painting.

This ancient art, after having been long lost, was restored by Count Caylus, a member of the Academy of Inscriptions in France; and the method of painting in wax was announced to the Academy of Painting and Belles Lettres in the year 1753; though M. Bachelier, the author of a treatise *De l'Histoire et du Secret de la Peinture en Cire*, had actually painted a picture in wax in 1749; and he was the first who communicated to the public the method of performing the operation of inuision, which is the principal characteristic of the encaustic painting. The Count kept his method a secret for some time, contenting himself with exhibiting a picture at the Louvre in 1754, representing the head of Minerva, painted in the manner of the ancients, which excited the curiosity of the public, and was very much admired. In the interval of suspense, several attempts were made to recover the ancient method of painting. The first scheme adopted was that of melting wax and oil of turpentine together, and using this composition as a vehicle for mixing and laying on the colours. But this method did not explain Pliny's meaning, as the wax is not burnt in this way of managing it. In another attempt, which was much more agreeable to the historian's description of encaustic painting, the wax was melted with strong lixivium of salt of tartar, and with this the colours were ground. When the picture was finished, it was gradually presented to the fire, so as to melt the wax; which was thus diffused through all the particles of the colours, so that they were fixed to the ground, and secured from the access of air or moisture. But the method of Count Caylus is much more simple: the cloth or wood which he designed for the basis of his picture, is waxed over, by only rubbing it simply with a piece of bees-wax; the wood or cloth, stretched on a frame, being held horizontally over, or perpendicularly before a fire, at such a distance, that the wax might gradually melt, whilst it is rubbed on, diffuse itself, penetrate the body, and fill the interstices of the texture of the cloth, which, when cool, is fit to paint upon; but as water-colours, or those that are mixed up with common water, will not adhere to the wax, the whole picture is to be first rubbed over with Spanish chalk or white, and then the colours are applied to it; when the picture is dry, it is put near the fire, whereby the wax melts, and absorbs all the colours.

Mr. J. H. Muntz, in a treatise on this subject, has proposed several improvements in the art of encaustic painting. When the painting is on cloth, he directs it to be prepared by stretching it on a frame, and rubbing one side several times over with a piece of bees-wax, or virgin wax, till it is covered with a coat of wax of considerable thickness. In fine linen, this is the only operation necessary previous to painting; but coarse cloth must be rubbed gently on the unwaxed side with a pumice-stone, to take off all those knots which would prevent the free and accurate working of the pencil. Then the subject is to be painted on the unwaxed side with colours prepared and tempered with water; and when the picture is finished, it must be brought near the fire, that the wax may melt and fix the colours. This method, however, can only be applied to cloth or paper, through the substance of which the wax may pass; but in wood, stone, metals,

or

Encaustic
Painting.

or plaster, the former method of Count Caylus must be observed.

Mr Muntz has also discovered a method of forming grounds for painting with crayons, and fixing these, as well as water-colours employed with the pencil. On the unwaxed side of a linen cloth, stretched and waxed as before, lay an even and thick coat of the colour proper for the ground; having prepared this colour by mixing some proper pigment with an equal quantity of chalk, and tempering them with water. When the colour is dry, bring the picture to the fire, that the wax may melt, pass through the cloth, and fix the ground. An additional quantity of wax may be applied to the back of the picture, if that which was first rubbed on should not be sufficient for the body of colour; but as this must be laid on without heat, the wax should be dissolved in oil of turpentine, and applied with a brush, and the canvas be again exposed to the fire, that the fresh supply of wax may pass through the cloth, and be absorbed by the colour; and thus a firm and good body will be formed for working on with the crayons. If cloth and paper are joined together, the cloth must be first fixed to the straining frame, and then the paper must be pasted to it with a composition of paste made with wheaten flour, or starch and water, and about a twelfth part of its weight of common turpentine. The turpentine must be added to the paste when it is almost sufficiently boiled, and the composition well stirred, and left to simmer over the fire for five or six minutes: let wax be dissolved in oil of turpentine to the consistence of a thin paste: and when the cloth and paper are dry, let them be held near a fire; and with a brush lay a coat of the wax and turpentine on both sides the joined cloth and paper, in such a degree of thickness, that both surfaces may shine throughout without any appearance of dull spots. Then expose the cloth to the fire, or to the sun; by which means the oil will evaporate, and the wax become solid, and be fit to receive any composition of colour for a ground, which is to be laid on as above directed in the case of cloth without paper.

Almost all the colours that are used in oil-painting may be also applied in the encaustic method. Mr Muntz objects, indeed, to brown, light pink, and unburnt *terra di Sienna*; because these, on account of their gummy or stony texture, will not admit such a cohesion with the wax as will properly fix them; but other colours which cannot be admitted in oil painting, as red lead, red orpiment, crystals of verdegis, and red precipitate of mercury, may be used here. The crayons used in encaustic painting are the same with those used in the common way of crayon painting, excepting those that in their composition are too tenacious; and the method of using them is the same in both cases.

The encaustic painting has many peculiar advantages: though the colours have not the natural varnish or shining which they acquire with oil, they have all

the strength of paintings in oil, and all the airiness of water-colours, without partaking of the apparent character or defects of either: they may be looked at in any light and in any situation, without any false glare: the colours are firm, and will bear washing; and a picture, after having been smoked, and then exposed to the dew, becomes as clean as if it had been but just painted. It may also be retouched at pleasure without any detriment to the colours; for the new colours will unite with the old ones, without spots, as is the case in common size painting; nor is it necessary to rub the places to be touched with oil as in oil pictures; it is not liable to crack, and easily repaired, if it should chance to suffer any injury. The duration of this painting is also a very material advantage; the colours are not liable to fade and change; no damp can affect them, nor any corrosive substance injure them; nor can the colour fall off in shivers from the canvas. However notwithstanding all these and other advantages enumerated by the Abbé Mazeas and Mr Muntz, this art has not yet been much practised. Many of these properties belong to a much higher species of encaustic painting afterwards discovered in England, the colours of which are fixed by a very intense heat; nor are the colours or grounds on which they are laid liable to be dissolved or corroded by any chemical menstruum, nor, like the glassy colours of enamel, to run out of the drawing on the fire. What this method consists in will appear from the following account communicated in a letter from Josiah Colebrooke to the earl of Macclesfield, president of the Royal Society in 1759.

“The art of painting with burnt wax (says he) has long been lost to the world. The use of it to painters in the infancy of the art of painting was of the utmost consequence. Drying oil being unknown, they had nothing to preserve their colours entire from the injury of damps and the heat of the sun: a varnish of some sort was therefore necessary; but they being unacquainted with distilled spirits, could not, as we now do, dissolve gums to make a transparent coat for their pictures: this invention therefore of burnt wax supplied that defect to them; and with this manner of painting the chambers and other rooms in their houses were furnished: this Pliny calls *encaustum*, and we *encaustic painting*.”

“The following experiments which I have the honour to lay before your Lordship and the Society, were occasioned by the extract of a letter from the Abbé Mazeas, translated by Dr Parsons, and published in the second part of the 49th volume of the Philosophical Transactions, N^o 100. concerning the ancient method of painting with burnt wax, revived by Count Caylus.

“The count’s method was, 1. To rub the cloth or board designed for the picture simply over with bees-wax. 2. To lay on the colours mixed with common water: but as the colours will not adhere to the wax, the whole picture was first rubbed over with (A) Spanish

Encaustic
Painting.

(A) “Spanish chalk is called by Dr Parsons, in a note, *Spanish white*. This is a better kind of whitening than the common, and was the only white that had the name of *Spanish* annexed to it that I could procure, though I inquired for it at most if not all the colour shops in town.

Encaustic
Painting.

nish chalk, and then the colours are used. 3. When the picture is dry, it is put near the fire, whereby the wax melts, and absorbs all the colours.

"*Exp. 1.* A piece of oak board was rubbed over with bees-wax, first against the grain of the wood, and then with the grain, to fill up all the pores that remained after it had been planed, and afterwards was rubbed over with as much dry Spanish white as could be made to stick on it. This, on being painted (the colours mixed with water only), so clogged the pencil, and mixed so unequally with the ground, than it was impossible to make even an outline, but what was so much thicker in one part than another, that it would not bear so much as the name of painting; neither had it any appearance of a picture. However, to pursue the experiment, this was put at a distance from the fire, on the hearth, and the wax melted by slow degrees: but the Spanish white (though laid as smooth as so soft a body would admit, before the colour was laid on), on melting the wax into it, was not sufficient to hide the grain of the wood, nor show the colours by a proper whiteness of the ground; the wax, in rubbing on the board, was unavoidably thicker in some parts than in others, and the Spanish white the same: on this I suspected there must be some mistake in the Spanish white, and made the inquiry mentioned in the note (A).

"To obviate the inequality of the ground in the first experiment.

"*Exp. 2.* A piece of old wainscot (oak-board) $\frac{1}{4}$ th of an inch thick; which, having been part of an old drawer, was not likely to shrink on being brought near the fire: this was smoothed with a fish-skin; made quite warm before the fire; and then, with a brush dipped in white wax, melted in an earthen pipkin, smeared all over, and applied to the fire again. That the wax might be equally thick in all parts of the board, a ground was laid (on the waxed board) with levigated chalk mixed with gum-water (viz. gum-arabic dissolved in water): When it was dry, I painted it with a kind of landscape; and pursuing the method laid down by Count Caylus, brought it gradually to the fire. I fixed the picture on a fire-screen, which would preserve the heat, and communicate it to the back part of the board. This was placed first at the distance of three feet from the fire, and brought forwards by slow degrees, till it came within one foot of the fire, which made the wax swell and bloat up the picture; but as the chalk did not absorb the wax, the picture fell from the board and left it quite bare.

"*Exp. 3.* I mixed three parts white wax, and one part white resin, hoping the tenacity of the resin might preserve the picture. This was laid on a board heated with a brush as in the former; and the ground was chalk prepared as before. This was placed horizontally on an iron box, charged with a hot heater, shifting it from time to time, that the wax and resin might penetrate the chalk; and hoping from this position, that the ground, bloated by melting the wax, would

subside into its proper place; but this, like the other, came from the board, and would not at all adhere.

"*Exp. 4.* Prepared chalk four drams, white wax, white resin, of each a dram, burnt alabaster half a dram, were all powdered together and sifted, mixed with spirit of molasses instead of water, and put for a ground on a board smeared with wax and resin, as in *Exp. 3.* This was also placed horizontally on a box-iron as the former: the picture blistered, and was cracked all over; and though removed from the box-iron to an oven moderately heated (in the same horizontal position), it would not subside, nor become smooth. When it was cold, I took an iron spatula made warm, and moved it gently over the surface of the picture, as if I were to spread a plaster. (This thought occurred, from the board being prepared with wax and resin, and the ground having the same materials in its composition, the force of the spatula might make them unite). This succeeded so well, as to reduce the surface to a tolerable degree of smoothness; but as the ground was broke off in many places, I repaired it with flake white, mixed up with the yoke of an egg and milk, and repainted it with molasses spirit (instead of water), and then put it into an oven with a moderate degree of heat. In this I found the colours fixed, but darker than when it was at first painted; and it would bear being washed with water, not rubbed with a wet cloth.

"*Exp. 5.* A board (that had been used in a former experiment) was smeared with wax and resin, of each equal parts; was wetted with molasses spirit, to make whitening (or Spanish white) mixed with gum water adhere. This, when dry, was scraped with a knife, to make it equally thick in all places. It was put into a warm oven, to make the varnish incorporate partly with the whitening before it was painted; and it had only a small degree of heat: water was only used to mix the colours. This was again put into an oven with a greater degree of heat; but it flaked off from the board: whether it might be owing to the board's having had a second coat of varnish (the first having been scraped and melted off), and that the unctuous parts of the wax had so entered its pores, that it would not retain a second varnish, I cannot tell.

"*Exp. 6.* Having miscarried in these trials, I took a new board, planed smooth, but not polished either with a fish skin or rushes: I warmed it, and smeared it with wax only; then took *cimolia* (tobacco-pipe clay) divested of its sand, by being dissolved in water and poured off, leaving the coarse heavy parts behind. After this was dried and powdered, I mixed it with a small quantity of the yolk of an egg and cow's milk, and made a ground with this on the waxed board: this I was induced to try, by knowing that the yolk of an egg will dissolve almost all unctuous substances, and make them incorporate with water; and I apprehended, that a ground thus prepared, would adhere so much the more firmly to the board than the former had done, as to prevent its flaking off. The milk, I thought, might

"My friend M. da Costa showed me a piece of Spanish chalk in his collection, which seemed more like a CIMOLIA (tobacco-pipe clay), and was the reason of my using that in one of the experiments.

Encaustic
Painting.

Encaustic
Painting.

might answer two purposes; first, by uniting the ground with the wax; and secondly, by answering the end of size or gum-water, and prevent the colours from sinking too deep into the ground, or running one into another. When the ground was near dry, I smoothed it with a pallet knife, and washed with milk and egg where I had occasion to make it smooth and even: when dry I painted it, mixing the colours with common water; this, on being placed horizontally in an oven only warm enough to melt the wax, flaked from the board; but held so much better together than any of the former, that I pasted part of it on paper.

"*Exp.* 7. Flake-white (or the purest sort of white-lead) mixed with egg and milk, crumbled to pieces in the oven, put on the waxed board, as in the last experiment.

"The bad success which had attended all the former experiments, led me to consider of what use the wax was in this kind of painting: and it occurred to me, that it was only as a varnish to preserve the colours from fading.

"In order to try this:

"*Exp.* 8. I took what the brick-layers call *fine stuff*, or *putty*, (B): to this I added a small quantity of burnt alabaster, to make it dry: this it soon did in the open air; but before I put on any colours, I dried it gently by the fire, lest the colours should run. When it was painted, I warmed it gradually by the fire (to prevent the ground from cracking) till it was very hot. I then took white wax three parts, white resin one part; melted them in an earthen pipkin, and with a brush spread them all over the painted board, and kept it close to the fire in a perpendicular situation, that what wax and resin the plaster would not absorb might drop off. When it was cold, I found the colours were not altered, either from the heat of the fire, or passing the brush over them. I then rubbed it with a soft linen cloth, and thereby procured a kind of gloss, which I afterwards increased by rubbing it with a hard brush; which was so far from scratching or leaving any marks on the picture, that it became more smooth and polished by it.

"After I had made all the foregoing experiments, in conversation with my honoured and learned friend Dr Kidby, a fellow of this society, I said I had been trying to find out what the encaustic painting of the ancients was. Upon which he told me, that there was a passage in Vitruvius *de Architectura* relative to that kind of painting: and was so good as to transcribe it for me from the 7th book, chap. 9. *De minii temperatura*. Vitruvius's words are: *At si quis subtilior fuerit, et voluerit expolitionem miniaceam suum colorem retinere, cum paries expolitus et aridus fuerit, tunc ceram*

*Punicam liquefactam igni, paulo oleo temperatam, seta inducat, deinde postea carbonibus in ferreo vase compositis, eam ceram apprime cum pariete, calefaciendo sudore cogat, fiatque ut peræquetur, deinde cum candela linteisque puris subigat, uti signa marmorea nuda curantur. Hæc autem *καυσις* Græcè dicitur. Ita obstans ceræ Punicæ lorica non patitur, nec lunæ splendorem, nec solis radios lambendo eripere ex his politionibus colorem.*

Encaustic
Painting.

"Which I thus translate: 'But if any one is more wary, and would have the polishing [painting] with vermilion hold its colour, when the wall is painted and dry, let him take Carthaginian [Barbary] wax, melted with a little oil, and rub it on the wall with a hair-pencil; and afterwards let him put live coals into an iron vessel [chafing-dish], and hold it close to the wax, when the wall, by being heated, begins to sweat; then let it be made smooth: afterwards let him rub it with a (C) candle and (D) clean linen rags, in the same manner as they do the naked marble statues. This the Greeks call *καυσις*. The coat of Carthaginian wax (thus put on) is so strong, that it neither suffers the moon by night, nor the sun-beams by day, to destroy the colour.'

"Being satisfied, from this passage in Vitruvius, that the manner of using wax in *Exp.* 8. was right, I was now to find if the wax-varnish, thus burnt into the picture, would bear washing. But here I was a little disappointed; for rubbing one corner with a wet linen cloth, some of the colour came off; but washing it with a soft hair-pencil dipped in water, and letting it dry without wiping, the colour stood very well.

"A board painted, as in *Exp.* 8. was hung in the most smoky part of a chimney for a day, and exposed to the open air in a very foggy night. In the morning the board was seemingly wet through, and the water ran off the picture. This was suffered to dry without wiping: and the picture had not suffered at all from the smoke or the dew, either in the ground or the colours; but when dry, by rubbing it, first with a soft cloth, and afterwards with a brush, it recovered its former gloss.

"Suspecting that some tallow might have been mixed with the white wax I had used, which might cause the colours to come off on being rubbed with a wet cloth, I took yellow wax which had been melted from the honeycomb in a private family, and consequently not at all adulterated: to three parts of this I added one part resin, and melted them together.

"*Exp.* 9. Spanish-white, mixed with fish-glue, was put for a ground on a board, and painted with water-colours only. The board was made warm; and then the wax and resin were put on with a brush, and kept close to the fire till the picture had imbibed all the varnish,

(B) "Putty is lime flaked, and while warm, dissolved in water, and strained through a sieve.

(C) "The account of the method of polishing [painting] walls coloured with vermilion, gave me great satisfaction, as it proved the method I had taken in experiment 8. (which I had tried before I saw or knew of this passage in Vitruvius) was right. The use of the candle, as I apprehend, was to melt the wax on the walls where by accident the brush had put on too much, or afford wax where the brush had not put on enough, or had left any part bare.

(D) "The rubbing the wall with a linen cloth, while warm, will do very well where there is only one colour to be preserved; but where there are many, as in a landscape, it will be apt to take off some, or render the colouring rather faint; which I found by wiping the wax off from a painting while it was hot.

Encaustic. varnish, and looked dry. When it was cold, I rubbed it first with a linen cloth, and then polished it with a hard brush.

“ In these experiments I found great difficulties with regard to colours. Many water colours being made from the juices of plants, have some degree of an acid in them; and these, when painted on an alkaline ground, as chalk, whitening, *cimolia*, and plaster, are totally changed in their colours, and from green become brown; which contributes much to make the experiments tedious. I would therefore advise the use of mineral or metallic colours for this sort of painting, as most likely to preserve their colour: for although I neutralized Spanish white, by fermenting it with vinegar, and afterwards washed it very well with water, it did not succeed to my wish.

“ These experiments, and this passage from Vitruvius, will in some measure explain the obscurity of part of that passage in Pliny which Dr Parsons, in his learned comment on the encaustic painting with wax, seems to despair of.

“ *Ceris pingere*, was one species of encaustic painting. *Εγκαυσον, inustum*, may be translated, “ forced in by the means of fire; burnt in:” for whatever is forced in by the help of fire can be rendered into Latin by no other significant word that I know of but *inustum*. If this is allowed me, and I think I have the authority of Vitruvius (a writer in the Augustan age) for it, who seems to have wrote from his own knowledge, and not like Pliny, who copied from others much more than he knew himself, the difficulty with regard to this kind of painting is solved, and the encaustic with burnt wax recovered to the public.

“ What he means by the next kind he mentions, *in ebore cestro id est viriculo*, I will not attempt to explain at present.

“ The ship-painting is more easily accounted for, the practice being in part continued to this time; and is what is corruptly called *breaming*, for brenning or burning.

“ This is done by reeds set on fire, and held under the side of a ship till it is quite hot; then resin, tallow, tar, and brimstone, melted together, and put on with a hair brush while the planks remain hot, make such a kind of paint as Pliny describes: which, he says, *nec sole, nec sale ventisque corrumpitur*. As they were ignorant of the use of oil-painting, they mixed that colour with the wax, &c. which they intended for each particular part of the ship, and put it on in the manner above described.

“ In the pictures painted for these experiments, and now laid before your lordship and the society, I hope neither the design of the landscape, nor the execution of it, will be so much taken into consideration as the varnish (which was the thing wanted in this inquiry): and I think that will evince, that the encaustic painting with burnt wax is fully restored by these experiments; and though not a new invention, yet having been lost for so many ages, and now applied further, and to other purposes, than it was by Vitruvius (who confined it to vermilion only), may also amount to a new discovery, the use of which may be a means of preserving many curious drawings to posterity; for this kind of painting may be on paper, cloth, or any other substance that will admit a ground to be laid on it. The

VOL. VIII. Part I.

process is very simple, and is not attended with the disagreeable smell unavoidable in oil-painting, nor with some inconveniences inseparable from that art; and as there is no substance we know more durable than wax, it hath the greatest probability of being lasting.”

Still, however, there seem to have been some defects or inconveniences attending these and other subsequent attempts: for we find the ancient or some similar method of painting in wax remaining a desideratum upwards of 25 years after the publication of the preceding experiments; when in 1787 a method was communicated to the Society of Arts by Miss Greenland, for which she was rewarded with a prize. The ground of her information she received at Florence, through the acquaintance of an amateur of painting, who procured her the satisfaction of seeing some paintings in the ancient Grecian style, executed by Signora Parenti, a professor at that place, who had been instructed by a Jesuit at Pavia, the person who made the farthest discoveries in that art. Miss Greenland's friend knowing she was fond of painting, informed her what were the materials the painters used, but could not tell her the proportions of the composition; however, from her anxiety to succeed in such an acquisition, she made various experiments, and at last obtained such a sufficient knowledge of the quantities of the different ingredients as to begin and finish a picture, which she afterwards presented to the Society for their inspection.

Her method is as follows: “ Take an ounce of white wax, and the same weight of gum mastic powdered. Put the wax in a glazed earthen vessel over a very slow fire; and when it is quite dissolved, strew in the mastic, a little at a time, stirring the wax continually until the whole quantity of gum is perfectly melted and incorporated: then throw the paste into cold water; and when it is hard, take it out of the water, wipe it dry, and beat it in one of Mr Wedgwood's mortars, observing to pound it at first in a linen cloth to absorb some drops of water that will remain in the paste, and would prevent the possibility of reducing it to a powder, which must be so fine as to pass through a thick gauze. It should be pounded in a cold place and but a little while at a time, as after long beating the friction will in a degree soften the wax and gum, and instead of their becoming a powder they will return to a paste.

“ Make some strong gum-arabic water; and when you paint, take a little of the powder, some colour, and mix them together with the gum-water. Light colours require but a small quantity of the powder, but more of it must be put in proportion to the body and darkness of the colours; and to black there should be almost as much of the powder as colour.

“ Having mixed the colours, and no more than can be used before they grow dry, paint with fair water, as is practised in painting with water-colours, a ground on the wood being first painted of some proper colour prepared in the same manner as is described for the picture; walnut-tree and oak are the sorts of wood commonly made use of in Italy for this purpose. The painting should be very highly finished; otherwise, when varnished, the tints will not appear united.

“ When the painting is quite dry, with rather a hard brush, passing it one way, varnish it with white wax, which is put into an earthen vessel, and kept melted over a very slow fire till the picture is varnished, tak-

Enceinte
||
Enchasing.

king great care the wax does not boil. Afterwards hold the picture before a fire, near enough to melt the wax, but not make it run; and when the varnish is entirely cold and hard, rub it gently with a linen cloth. Should the varnish blister, warm the picture again very slowly, and the bubbles will subside. When the picture is dirty, it need only be washed with cold water."

The opinion given by the Society upon the above is: The method made use of by Miss Greenland provides against all inconveniences; and the brilliancy of the colours in the picture painted by her, and exhibited to the Society, fully justifies the opinion, that the art of painting in wax, as above described, highly merited the reward of a gold pallet voted to her on this occasion.

ENCEINTE, in *Fortification*, is the wall or rampart which surrounds a place, sometimes composed of bastions or curtains, either faced or lined with brick or stone, or only made of earth. The enceinte is sometimes only flanked by round or square towers, which is called a *Roman wall*.

ENCEPHALI, in *Medicine*, worms generated in the head, where they cause so great a pain as sometimes to occasion distraction.

The encephali are very rare; but there are some diseases wherein they swarm: from whence we are told pestilential fevers have wholly arisen. Upon the dissection of one who died of this fever, a little, short, red worm was found in the head, which malmsey wine, wherein horse-radish had been boiled, could alone destroy. This medicine was afterwards tried on the sick, most of whom it cured.

The like worms have also been taken out by trepanning, and the patient cured. Those worms that generate in the nose, ears, and teeth, are also called *encephali*.

ENCHANTER, a person supposed to practise enchantment or fascination. See FASCINATION, WITCH-CRAFT, &c.

ENCHANTER'S *Nightshade*. See CIRCŒA, BOTANY *Index*.

ENCHASING, INCHASING, or *Chasing*, the art of enriching and beautifying gold, silver, and other metal-work, by some design or figures represented thereon in low relievo.

Enchasing is practised only on hollow thin works, as watch-cases, cane-heads, tweezer-cases, or the like. It is performed by punching or driving out the metal, to form a figure, from withinside, so as to stand out prominent from the plane or surface of the metal. In order to this, they provide a number of fine steel blocks or punches of divers sizes; and the design being drawn on the surface of the metal, they apply the inside upon the heads or tops of these blocks, directly under the lines or parts of the figures; then, with a fine hammer, striking on the metal, sustained by the block, the metal yields, and the block makes an indenture or cavity on the inside, corresponding to which there is a prominence on the outside, which is to stand for that part of the figure.

Thus the workman proceeds to chase and finish all the parts by the successive application of the block and hammer to the several parts of the design. And it is wonderful to consider with what beauty and justness, by this simple piece of mechanism, the artists in this

kind will represent foliage, grotesques, animals, histories, &c.

ENCLITICA, in *Grammar*, particles which are so closely united with other words as to seem part of them, as in *virumque*, &c.—There are three enclitic particles in Latin, viz. *que, ne, ve*.

ENCRATITES, in church-history, heretics who appeared towards the end of the second century: they were called *Encratites*, or *Continentes*, because they gloried in abstaining from marriage and the use of wine and animal food.

ENCURECK, in *Natural History*, a venomous insect found in Persia, and said to be a kind of tarantula. According to Osearius, as quoted by Mr Boyle, it neither stings nor bites; but lets fall its venom like a drop of water, which causes insufferable pain in the part for a time, and afterwards so profound a sleep, that, as report says, nothing can awake the patient except crushing one of the creatures on the part affected. It is nevertheless said, that the sheep eat these insects without damage.

ENCYCLOPÆDIA, a term nearly synonymous with CYCLOPÆDIA; but adopted in preference to it in denominating the present work, as being more definite and of better authority. According to an observation of the late learned printer Mr Bower, the preposition EN makes the meaning of the word more precise. For *Cyclopædia* may denote "the instruction of a circle," as *Cyropædia* is "the instruction of Cyrus," whereas in *Encyclopædia* the preposition determines the word to be from the dative of *cyclus*, "instruction IN a circle." And Vossius, in his book *De viuis sermonis*, has observed, "That *Cyclopædia* is used by some authors, but *Encyclopædia* by the best."

ENDEMIC, or ENDEMICAL, DISEASES, those to which the inhabitants of particular countries are subject more than others, on account of the air, water, situation, and manner of living.

ENDIVE. See CICHORIUM, BOTANY and GARDENING *Index*.

ENDLESS, something without an end: thus authors mention endless rolls, the endless screw, &c.

ENDOR, in *Ancient Geography*, a town of Galilee, four miles to the south of Mount Tabor, in the tribe of Manasseh, where the Pythonefs was consulted by Saul: at this day, says Jerome, a large village.

ENDORSE, in *Heraldry*, an ordinary, containing the eighth part of a pale, which Leigh says is only used when a pale is between two of them.

ENDORSED, in *Heraldry*, is said of things borne back to back, more usually called ADOSSE.

ENDORSEMENT, in *Law and Commerce*. See INDORSEMENT.

ENDOWMENT, in *Law*, denotes the settling a dower on a woman; though sometimes it is used figuratively, for settling a provision upon a parson, on the building of a church; or the severing a sufficient portion of tithes for a vicar, when the benefice is appropriated.

ENDYMION, in fabulous history, a shepherd, son of Æthlius and Calyce. It is said that he required of Jupiter to grant to him to be always young, and to sleep as much as he would; whence came the proverb of *Endymionis somnum dormire*, to express a long sleep. Diana saw him naked as he slept on Mount Latmos; and

Enclitica
||
Endymion.

Enemy
||
Enfield.

and was so struck with his beauty, that she came down from heaven every night to enjoy his company. Endymion married Chromia daughter of Itonus; by whom he had three sons Pæon, Epeus, and Æolus, and a daughter called *Eurydice*. The fable of Endymion's amours with Diana, or the moon, arose from his knowledge of astronomy; and as he passed the night on some high mountain to observe the heavenly bodies, it came to be reported that he was courted by the moon. Some suppose that there were two of that name; the son of a king of Elis, and the shepherd or astronomer of Caria. The people of Heraclea maintained that Endymion died on Mount Latmos; and the Eleans pretended to show his tomb at Olympia in Peloponnesus.

ENEMY, in *Law*, an alien or foreigner, who publicly invades the kingdom.

ENERGUMENS, in church-history, persons supposed to be possessed by the devil, concerning whom there were many regulations among the primitive Christians. They were denied baptism and the eucharist; at least, this was the practice of some churches: and though they were under the care of exorcists, yet it was thought a becoming act of charity to let them have the public prayers of the church, at which they were permitted to be present. See EXORCISM.

ENERGY, a term of Greek origin, signifying the power, virtue, or efficacy of a thing. It is also used, figuratively, to denote emphasis of speech.

ENERVATING, the act of destroying the force, use, or office, of the nerves, either by cutting them, by weakening them with debauchery, or by some other violence.

Excess of wine, and other strong, hot, spirituous liquors, enervate or weaken the nerves. When they would render a horse useless, they enervate him, or cut his nerves.

ENFANS PERDUS, the same with forlorn hope. See FORLORN.

ENFIELD, WILLIAM, LL. D. an elegant and very justly admired writer, was born in the year 1741, at Sudbury. His original destination was for the sacred office of the ministry, and he was educated among the protestant dissenters at Daventry, where the high polish which he gave to his compositions, distinguished him from many of his cotemporaries. The congregation of Benn's-garden of Liverpool made choice of him for their minister in the year 1763, when he was not more than 22 years of age; and in this situation he was soon taken notice of as an amiable member of society, and an engaging preacher. While he resided in Liverpool, he published two volumes of sermons, 12mo, as well as a collection of hymns and family prayers, which met with a very favourable reception. In the year 1770, he was appointed tutor and lecturer in the belles lettres at Warrington academy, which he filled for some years with general approbation and unwearied diligence. He was the compiler of many useful books, among the most popular of which we may rank his "Speaker," composed of pieces of recitation from the best and most approved English authors. At the beginning of this collection there is an excellent essay on elocution. The Preacher's Directory; the English Preacher, a collection of sermons in 9 vols 12mo, from the most celebrated authors; Biographical Sermons on

Enfield
||
Enfield.

the principal characters in the Old and New Testament, with a number of single sermons on particular occasions, were also the productions of his pen. The controversy relative to literary property also engaged his attention, and on this he wrote a quarto pamphlet. He likewise published in one volume 4to, Institutes of Natural Philosophy, theoretical and experimental; and during the time of his residence at Warrington, as teacher in the academy, the university of Edinburgh conferred on him the degree of LL. D. When that academy was dissolved in 1783, Dr Enfield continued for two years at Warrington in the capacity of a private tutor, after which he was chosen pastor of the Octagon meeting-house at Norwich, in the year 1785. He at length gave up his private tuition, and entirely devoted his time to literary labours, and the peculiar duties of his pastoral charge. About this time he lost his eldest son, who had been appointed to the office of town-clerk of Nottingham. This event would have been productive of very serious effects on his health and spirits, had it not been for the consolation of religion and philosophy, which are sufficient to support the human mind under the pressure of the severest calamities. He undertook and executed the laborious task of abridging Brucker's History of Philosophy, which in 1791 he published in 2 vols 4to. It has been allowed that the tenets of the different sects of philosophers were never before exhibited to the world with such perspicuity and elegance; qualifications for which Dr Enfield was undoubtedly eminent. He contributed largely to the Biographical Dictionary, published under the inspection of Dr Aiken and others.

An unsuspected distemper hastened the termination of his useful life, and on the 3d of November 1797, he expired in the 57th year of his age. The general love of mankind which Dr Enfield possessed, falls to the lot of few; nor does it often happen, that an individual dies so universally lamented. It was essential to him to be amiable in every station and condition of life. His posthumous sermons in 3 vols 8vo, had a very numerous list of subscribers, a strong proof of the estimation in which he was held by all who knew him, either personally or by report. In these discourses he treats chiefly on moral topics, which he discusses with the nicest discrimination, and in a train of the most pleasing and manly eloquence.

ENFILADE, in the art of war, is used in speaking of trenches, or other places, which may be scoured by the enemy's shot along their whole length. In conducting the approaches at a siege, care must be taken that the trenches be not enfiladed from any work of the place.

ENFINE', formerly ANTINOE, a city of Egypt, built by Adrian in honour of his favourite Antinous. It is situated towards the middle of the Said, or Upper Egypt, and still contains several stately monuments of antiquity. In ancient times this city was very magnificent. It was about half a league in circumference, having two principal streets 45 feet wide, intersecting each other at right angles, and running through its whole length. The others were more narrow, but equally straight; the two largest having gates at each end, part of which still remain. According to the Nubian geographer, it was called the city of the Magi, because Pharaoh is said to have caused the magicians

Engine
||
Engendering.

come from thence to his court. Near it were the ruins of Abydus, where there was an oracle of the god Befas, one of the most ancient in Egypt, and which was still famous in the time of Constantius; and hence some have derived the appellation just mentioned, the neighbouring people coming in crowds to consult the oracle.

The ruins of the gates are the most beautiful pieces of architecture to be met with in this place. The handsomest has three vaulted entries; the middle one being 40 feet in height, 22 wide, and 20 thick; the other two smaller. Each of the facades of this edifice is ornamented with four pilasters in bas relief, with Corinthian capitals, the acanthus leaves of which have a considerable projection. It was surrounded by eight Corinthian columns, of which only one now remains, but the pedestals of the rest are still entire. Besides these, there are heaps of rubbish in different parts of the town, apparently the remains of ancient temples or palaces. All these seem to have been bordered by a colonnade, forming a portico on each side, where the inhabitants might walk secure from the heat of the sun. One of the squares was ornamented with four large Corinthian pillars, three of which are destroyed all but the bases. The fourth is quite entire, about 50 feet high, and the shaft composed of several stones. The pedestal has a Greek inscription, pretty much defaced, dedicating it to the emperor Alexander Severus, to whom the senate of ALEXANDRIA had already dedicated the famous column mentioned under that article. These four other columns were therefore probably raised in honour of that emperor after his victories over the Persians; for the foliage of the oak, with which the first stone of the shaft is decorated, was a sign of victory among the Romans. Towards the end of the fourth century the city was peopled by Christians; and Palladius assures us, that there were at that place 12 convents of virgins, and several others inhabited by monks. In the convents there are still several Coptic monasteries possessed by monks equally miserable and ignorant. The Nubian geographer informs us, that the city was surrounded by a well cultivated country, abounding in fruits and harvests; but these have now given place to sands and barren deserts. The ruins of Abydus above mentioned are still to be seen near this place.

ENFRANCHISEMENT, in *Law*, the incorporating a person into any society or body-politic.

ENGASTRIMYTHI, in Pagan theology, the Pythians, or priestesses of Apollo, who delivered oracles from within, without any action of the mouth or lips.

The ancient philosophers, &c. are divided upon the subject of the engastrimythi. Hippocrates mentions it as a disease. Others will have it a kind of divination. Others attribute it to the operation or possession of an evil spirit. And others to art and mechanism. M. Scottus maintains that the engastrimythi of the ancients were poets, who, when the priests could not speak, supplied the defect by explaining in verse what Apollo dictated in the cavity of the basin on the sacred tripod.

ENGENDERING, a term sometimes used for the act of producing or forming any thing: thus meteors are said to be engendered in the middle region of the atmosphere, and worms in the belly.

ENGINE, in *Mechanics*, is a compound machine, made of one or more mechanical powers, as levers, pulleys, screws, &c. in order to raise, cast, or sustain any weight, or produce any effect which could not be easily effected otherwise. The word is formed of the French *engin*, from the Latin *ingenium*, "wit;" by reason of the ingenuity required in the contrivance of engines to augment the effect of moving powers.

ENGINE for *Extinguishing Fires*. See HYDROSTATICS *Index*.

Pile-ENGINE, one contrived for driving piles. See PILE-Engine.

Steam-ENGINE, a machine to raise water by fire, or rather by the force of water turned into steam. See STEAM-Engine.

ENGINEER, in the military art, an able expert man, who, by a perfect knowledge in mathematics, delineates upon paper, or marks upon the ground, all sorts of forts, and other works proper for offence and defence. He should understand the art of fortification, so as to be able, not only to discover the defects of a place, but to find a remedy proper for them; as also how to make an attack upon, as well as to defend, the place. Engineers are extremely necessary for these purposes: wherefore it is requisite, that besides being ingenious, they should be brave in proportion. When at a siege, the engineers have narrowly surveyed the place, they are to make their report to the general, by acquainting him which part they judge the weakest, and where approaches may be made with most success. Their business is also to delineate the lines of circumvallation and contravallation, taking all the advantages of the ground; to mark out the trenches, places of arms, batteries, and lodgments, taking care that none of their works be flanked or discovered from the place. After making a faithful report to the general of what is a-doing, the engineers are to demand a sufficient number of workmen and utensils, and whatever else is necessary.

ENGLAND, the southern division of the island of Great Britain. Including Wales, it is of a triangular form, and lies between the 50th and 55th degrees of north latitude, extending about 400 miles in length from south to north, and in some places it is 300 miles in breadth. It is bounded by Scotland on the north; by the English Channel on the south, dividing it from France; by the German sea on the east; and on the west by St George's, or the Irish Channel.

At what time the island of Britain was peopled is whence uncertain; nor do we know whether the southern or northern parts were first inhabited. We have no accounts that can be depended upon before the arrival of Julius Cæsar, and it is certain he found the southern parts full of people of a very warlike disposition. These people, according to Cæsar, were a colony of the Gauls; and this opinion is embraced by most of the ancient as well as modern writers. It is chiefly founded on the agreement observed by the Romans between the two nations in their customs, manners, language, religion, government, way of fighting, &c. The more northern inhabitants, according to Tacitus, came from Germany. This he infers from the make of their limbs; but Cæsar simply calls them *A-borigenes*.

England,

Engine
||
England.

England.
²
 Inhabited
 by 17 dif-
 ferent na-
 tions.

England, including the principality of Wales, when first invaded by the Romans, was divided into 17 petty states. 1. The Danmonii, called also *Dunmonii* and *Donmonii*, inhabiting the counties of Cornwall and Devonshire. 2. The Durotriges, who inhabited the tract now called *Dorsetshire*. 3. The Belgæ possessed Somersetshire, Wiltshire, and Hampshire. 4. The Attrebatii, or inhabitants of Berkshire. 5. The Regni, whose country bordered on that of the Attrebatii, and comprehended Surrey, Suffex, and part of the sea-coast of Hampshire. 6. The Cantii, inhabiting the county now called *Kent*. 7. The Dobuni are placed by Ptolemy on the north side of the Thames, near its head, in the counties of Gloucestershire and Oxfordshire. 8. The Cattieuchlani, *Calveuchlani*, *Cattidudani*, or *Cathcludani*, inhabited Buckinghamshire, Bedfordshire, and Hertfordshire. 9. The Trinobantes, who possessed the counties of Essex and Middlesex. 10. The Icenii, whose country comprehended Suffolk, Norfolk, Cambridge, and Huntingdonshire. These are by Ptolemy called *Simeni*, and by others *Tigeni*. Camden is of opinion, that they were the same whom Cæsar calls *Cenomagii*. 11. The Coritani, whose country comprehended Northamptonshire, Leicestershire, Rutlandshire, Lincolnshire, Nottinghamshire, and Derbyshire. 12. The Cornavii possessed Warwickshire, Worcestershire, Staffordshire, Shropshire, and Cheshire. 13. The Silures inhabited the counties of Radnorshire, Brecknockshire, Glamorganshire, with Herefordshire and Monmouthshire. 14. The Demetæ inhabited part of Caermarthenshire, Pembrokehire, and Cardiganhire. 15. The country of the Ordovices comprehended Montgomeryshire, Merionethshire, Caernarvonshire, Denbighshire, and Flintshire. 16. The Brigantes possessed the counties of Yorkshire, the bishopric of Durham, Lancashire, Westmorland, and Cumberland. 17. The county of Northumberland was held by the Ottadini, Ottadeni, or Ottalini. Their country, according to some, reached from the Tyne to the river Forth; though the most common opinion is, that it reached only to the Tweed.

The above-mentioned names of these nations are plainly Roman, but the etymology of them is not easily ascertained. Some attempt to derive them from words in the old British language; but as this subject at best must be very obscure and uncertain, we shall not enter into it.

³
 Julius Cæsar under-
 takes an ex-
 pedition in-
 to Britain.

Before the time of Julius Cæsar, the Romans had scarcely any knowledge of Britain; but that conqueror having subdued most of the Gallic nations on the opposite side of the channel, began to think of extending his conquests by the reduction of Britain. The motive for this expedition, ascribed to him by Suetonius, was a desire of enriching himself with the British pearls, which were then very much esteemed. The pretence, however, which he made use of in order to justify his invasion was, that the Britons had sent assistance to the Gauls during his wars with them.

Cæsar undertook his first expedition against Britain when the summer was already far spent, and therefore he did not expect to finish the conquest of the country that campaign. He thought, however, that it would be a considerable advantage to view the island, and learn something of the manners and customs of the natives; after which he could more easily take such mea-

asures as would ensure a permanent conquest on his return. Having marched all his forces into the country of the Morini, now the province of Picardy, from whence was the shortest passage into Britain; he ordered at the same time all the vessels that lay in the neighbouring ports, and a fleet which he had built the year before for an expedition against the Morini, to attend him. The Britons, alarmed at his preparations, sent ambassadors with offers of submission; but Cæsar, though he received them with great kindness, did not abandon his intended scheme of an invasion. He waited till the arrival of C. Volufenus, whom he had sent out with a single galley to make discoveries on the coast. Volufenus did not think proper to land; but, having made what observations he could, returned after five days absence, and Cæsar immediately set sail for Britain. His force consisted of two legions, embarked on board 80 transports; and he appointed 18 more which lay wind-bound about eight miles off, to convey over the cavalry; but these last orders were too slowly executed, which occasioned some difficulty in his landing.

The Britons at this time, according to Cæsar and other Roman historians, were very numerous, and had their country well stocked with cattle. Their houses resembled those of the Gauls; and they used copper or iron plates weighed by a certain standard instead of money. Their towns were a confused parcel of huts placed at a small distance from one another, generally in the middle of a wood, to which all the avenues were slightly guarded with ramparts of earth, or with trees. All the nations were in a state of the most wretched barbarism, even when compared with the barbarous Gauls on the continent. The use of clothes was scarcely known in the island. Only the inhabitants of the southern coast covered their nakedness with the skins of wild beasts; and this rather to avoid giving offence to the strangers who came to trade with them, than out of any principle of decency. It was a general custom among the Britons to paint their bodies with the juice of woad: but whether this was designed as ornament, or for any other purpose, is not known. They shaved their beards all except their upper lip, and wore long hair. They also had their wives in common, a custom which made them detestable to all other nations.

England

⁴
 Manners
 customs,
 &c. of the
 Britons.

The arms of the Britons were a sword, a short lance, and a shield. Breast-plates and helmets they looked upon rather to be incumbrances, and therefore made no use of them. They usually fought in chariots, some of which were armed with scythes at the wheels; they were fierce and cruel, and exceedingly blood-thirsty. When driven to distress, they could subsist themselves even on the bark and roots of trees; and Dio Cassius tells us, that they had ready, on all occasions, a certain kind of food, of which, if they took but the quantity of a bean, they were not troubled with hunger or thirst for a considerable time after. The southern nations, however, were somewhat more civilized; and the Cantii, or inhabitants of Kent, more so than any of the rest.

All the British nations at this time were very brave and resolute, owing to the continual dissensions among themselves. They proved therefore very formidable enemies to the Romans; but the same dissensions which had

England. had taught them the art of war, also prevented them from uniting in the defence of their country. As soon as they perceived Cæsar's fleet approaching, a number of cavalry and chariots were dispatched to oppose his landing, while a considerable body of infantry hastened after. What chiefly embarrassed the Romans in their attempt to land, was the largeness of their ships, which required a considerable depth of water. The soldiers, therefore, were obliged to leap into the sea while loaded with their armour; and at the same time to encounter the enemy, who were quite disengaged, as they either stood on dry ground, or waded but a little way into the water. Cæsar perceiving this disadvantage, ordered his galleys to advance, with their broadsides towards the shore, in order to drive the Britons from the water-side with their slings and arrows. On this the Britons, surpris'd at the galleys, a sort of shipping they had never before seen, began to give ground. The fight, however, continued for some time, greatly to the disadvantage of the Romans; till at last Cæsar, observing the distress of his men, caused several boats to be manned, and sent them to the assistance of those who were most exposed to the enemy's assault. The Romans then soon got the better of the undisciplined barbarians, however brave, and made good their landing; but they were unable to pursue the enemy for want of cavalry, which had not yet arrived.

5
They oppose Cæsar's landing.

6
They are defeated and sue for peace.

The Britons were so disheartened with this bad success, that they immediately sent ambassadors to sue for peace; which was granted, on condition of their delivering a certain number of hostages for their fidelity. Part of these they brought immediately; and promised to return in a few days with the rest, who, they said, lived at some distance. But, in the mean time, the 18 transports which carried Cæsar's cavalry, being driven back by a violent storm, and the fleet which lay in the road being greatly damaged by the same, the Britons thought proper to break their engagements. Having therefore privately assembled their forces, they fell unexpectedly on the seventh legion while at a distance from the rest and busied in foraging. Cæsar being apprised of their danger, hastened to their assistance with two cohorts, and at last repulsed the enemy.—This, however, proved only a temporary deliverance; for the Britons, thinking it would be possible for them to cut off all the Romans at once, dispatched messengers to inform several of the neighbouring nations of the weakness of the enemy's forces, and the happy opportunity that offered itself of destroying all these invaders at one blow.—On this, they drew together a great body of horse and foot, which boldly advanced to the Roman intrenchments. But Cæsar came out to meet them; and the undisciplined Britons being by no means able to cope with the Romans, were put to flight with great slaughter. Having burnt several towns and villages, the victors returned to their camp, where they were soon followed by new deputies from the Britons. Cæsar being in want of horse, and afraid lest another storm should destroy the remainder of his fleet, granted them peace on condition of their sending him double the number of hostages into Gaul which they had before promised. The same night he set sail, and soon arrived safe in Gaul.

7
Their treachery.

The Britons no sooner perceived the Romans gone, than, as before, they broke through their engagements. Of all the states who had promised to send hostages, only two performed their promises; and this neglect so provoked Cæsar, that he determined to return the year following with a far greater force. Having, therefore, caused his old vessels to be refitted, and a great many new ones to be built, he arrived off the coast of Britain with a fleet of 600 ships and 28 galleys. The Britons made no opposition to his landing; but Cæsar, getting intelligence that an army was assembled at no great distance, marched in quest of them. He found them encamped on the banks of a river, supposed to be the *Stour*, about 12 miles distant from the place where he had landed. They attempted to oppose his passage; but being briskly attacked by the Roman cavalry, they were obliged to retire into a wood, all the avenues of which were blocked up by trees cut down for that purpose. This fortification, however, proved insufficient to protect them. The seventh legion having cast themselves into a testudo, and thrown up a mount against their works, drove them from their asylum; but as the day was far spent, a pursuit was not thought advisable.

8
Cæsar returns.

9
Defeats the Britons.

Next morning Cæsar, with the greatest part of his army, which he divided into three bodies, marched out in quest of the enemy. But when he was already come in sight of their rear, he was overtaken by messengers, who informed him, that his fleet was greatly damaged by a violent storm which had happened the preceding night. This put an end to the pursuit for that time; but Cæsar having employed all the carpenters he had with him, and sent for others from Gaul, in order to repair the damage, resolved to prevent misfortunes of this kind for the future. He therefore drew all his ships ashore, and enclosed them within the fortifications of his camp. This arduous undertaking employed his whole army for 10 days; after which he again set out in quest of the enemy.

The Britons had made the best use they could of the respite afforded them by the storm. They were headed by Cassibelaunus king of the Trinobantes. He had formerly made war upon his neighbours; and having rendered himself terrible to them, was looked upon to be the most proper person for leading them on against the common enemy; and as several states had now joined their forces, the British army was very numerous. Their cavalry and chariots attacked the Roman army while on their march; but were repulsed with loss, and driven into the woods. The Romans pursued them too eagerly, and thus lost some of their own men; which encouraged the Britons to make another fierce attack; but in this also they were finally unsuccessful, and obliged to retire, though their loss seems not to have been great.

Next day the Britons suddenly attacked the Roman legions as they were foraging; but meeting with a vigorous resistance, they soon betook themselves to flight. The Romans pursued them so closely, that having neither time to rally nor get down from their chariots according to custom, great numbers of them were cut in pieces: and this overthrow had such an effect upon the auxiliaries of Cassibelaunus, that all of them abandoned him; nor did the Britons ever afterwards engage Cæsar with united forces. Cæsar, pursuing his victory, marched

England. marched towards the Thames, with a design to cross that river, and enter the territories of the Trinobantes. The river was fordable only at one place, and that not without great difficulty; but when he came to it, he found the enemy's forces drawn up in a considerable body on the opposite bank, which was fortified with sharp stakes. They had likewise driven many stakes of the same kind into the bottom of the river, the tops of which were covered with water. These stakes are visible to this day as a place called *Walton* in *Surry*. They are made of oak; and though they have been so long in the water, are as hard as *Brazil*, and as black as jet; and have sometimes been pulled out in order to make knife handles of them.

10
Cæsar crosses the Thames.

11
Gives the Britons frequent overthrows.

Cæsar was not at all dismayed at these difficulties, which he had intelligence of by prisoners and deserters. He ordered the cavalry to enter first, and the foot to follow. His orders were obeyed, and the soldiers advanced with such resolution, that though the infantry were up to the chin in water, the enemy, unable to sustain their assault, abandoned the bank and fled. After this defeat, *Cassibelaunus* himself despaired of success, and therefore dismissed all his forces except about 4000 chariots, with which he observed the motions of the Romans, harassing them by cutting off straggling parties, &c. This, however, was not sufficient to keep up the spirits of his countrymen. On the contrary, they deposed him from the kingdom, and chose *Mandubratius*, whose father had been murdered by *Cassibelaunus*, who thereupon usurped the kingdom. The young prince had fled to Cæsar, who gave him protection; and the Trinobantes now offered to submit to the conqueror, provided he would give them *Mandubratius* for their king.

Cæsar readily complied with the request of the Trinobantes upon their sending him 40 hostages; and the submission of the Trinobantes was soon followed by that of other states and tribes; for each of the 17 nations already mentioned were composed of several different tribes, of which no particular account can be given.—Cæsar next marched to *Verulamium*, or *Canterbury*, which was *Cassibelaunus*'s capital, and which he still kept possession of; but though the place was strongly fortified both by nature and art, the Britons were unable to bear the assault of the Romans, and therefore soon fled out at one of the avenues. Many were taken as they attempted to make their escape, and many more cut in pieces.

After this loss, *Cassibelaunus*, as his last resource, found means to draw into confederacy with him four kings of the *Cantii*. But though Cæsar gives them the title of kings, it is probable that they were only petty princes, tributary to the king of that nation. Their names were *Cingetorix*, *Corvilius*, *Taximagulus*, and *Segonax*. These, having raised what forces they could, attacked the camp where the ships were laid up: but the Romans having made a sally, repulsed them with great slaughter, and then returned to their trenches without any loss; after which, *Cassibelaunus* thought proper to submit to the conqueror. As the summer was already far spent, Cæsar hearkened to his proposals. A peace was concluded on the following terms, viz. that the Britons should pay an annual tribute to the Romans, that *Cassibelaunus* should leave

Mandubratius in peaceable possession of his dominions, that he should not molest the Trinobantes, and that he should deliver a certain number of hostages. These terms being agreed to, Cæsar set sail with his whole fleet from Britain, to which he never returned.

Such is the account given by Cæsar himself of his two expeditions into Britain; but other authors have spoken very doubtfully of his victories in this island. *Dio Cassius* tells us, that the Britons utterly defeated the Roman infantry, but were at last put in disorder by their cavalry. *Horace* and *Tibullus*, in many parts of their works, speak of the Britons as a people not yet conquered. *Tacitus* says, that Cæsar rather showed the Romans the way to Britain, than put them in possession of it; and *Lucan* tells us plainly, that Cæsar turned his back to the Britons and fled. This last, however, considering the consummate military genius of Cæsar, is by no means probable. That he left Britain, during the winter, was, in all probability, to prevent insurrections among the Gauls, which might very readily have happened: and that he did not return to finish his conquest can be no wonder, seeing his ambition would certainly be more gratified by being called emperor of Rome, than conqueror of Britain.

The departure of *Julius Cæsar*, which happened about 53 years before Christ, left the Britons without any fear of a foreign enemy. We are not, therefore, to imagine, that they would regard their promises of paying tribute; nor was it probably demanded for a good number of years afterwards. *Augustus*, however, when he had got himself fully established on the throne, had twice a design of invading Britain and forcing the inhabitants to pay the tribute promised to *Julius Cæsar*. Both times, however, he was prevented by revolts in different provinces in the empire, so that the Britons still continued to enjoy their liberty. They thought proper, however, to court the favour of the Romans as much as they could by pretended submissions; but, in the reign of *Claudius*, the Romans set about reducing them to subjection in good earnest. The occasion of this war is related by *Dio Cassius* as follows. "Cu-
13
nobelinus, the third in succession from *Cassibelaunus*, being dead, his two sons, *Togodumnus* and *Caracatus*, succeeded to the throne; but whether they reigned jointly or separately, is not known. In their reign one *Bercius*, of whom we also know very little, being driven out of the island for attempting to raise a sedition, fled with some of his partisans to Rome, and persuaded *Claudius* to make war on his countrymen. The Britons, on the other hand, resented the behaviour of *Claudius* in receiving these vagabonds, and therefore prohibited all intercourse with the Romans. A much smaller offence than this would have been sufficient at any time to provoke that haughty nation to declare war. An army was therefore immediately ordered into Britain, under the command of *Plautius prætor* in Gaul. The soldiers at first refused to embark, from a superstitious notion, that they were going to be sent without the compass of the world; and this mutiny being related to the Britons, they did not make the necessary preparations for their own defence. The Roman soldiers were soon brought to a sense of their duty; and set out from three different ports, in order to land in three different places of Britain at once.

Being

England.
12
He leaves the island altogether.

13
Why the war with the Romans was renewed.

England. Being driven back by contrary winds, their fears began to return; but they resumed their courage on the appearance of a meteor shooting from the east, which they imagined was sent from heaven to direct their course. They landed without opposition; and the Britons, not having drawn together a sufficient army, kept in small bodies behind their marshes, and in woods, in order to spin out the war till winter; which they thought Plautius, as Cæsar had done, would pass in Gaul.

14
The Britons defeated.

The Roman general marched first in quest of the two kings Togodumnus and Caractacus; both of whom he found out, and defeated one after another. He then reduced part of the Dobuni, at that time subject to the Cattiuchlani; and leaving a garrison to keep them in awe, he advanced to a river where the Britons lay carelessly encamped, supposing that the Romans could not pass it without a bridge. But the Germans in the Roman army had been accustomed to swim across the strongest currents with their heavy armour. They therefore passed the river first; and having, according to their orders, fallen only upon the enemy's horses which drew their chariots, these formidable machines were rendered entirely useless; and the Britons were put to flight as soon as another part of the forces could pass the river.

The Britons were not disheartened with this defeat, but engaged the Romans next day with great bravery. Victory continued long doubtful; but at length the Romans prevailed, and the Britons were forced to betake themselves to flight. This battle is thought to have been fought on the banks of the Severn. From thence the Britons fled to the mouth of the Thames. They were closely pursued by the Romans; but the latter being unacquainted with the flats and shallows of the river, were often in great danger. The Germans, however, crossed by swimming as before, and the rest on a bridge somewhat farther up the river; so that the Britons were in a short time surrounded on all sides, and great numbers of them cut in pieces. Many of the Romans, also, pursuing the fugitives with too great eagerness, were lost in the marshes.—In one of these battles Togodumnus was killed; but the Britons were so far from being disheartened, that they showed more eagerness than ever to oppose the Romans, in order to revenge his death. Plautius, therefore, did not think proper to penetrate farther into the country, but contented himself with putting garrisons in the places he had already conquered. He then wrote to the emperor himself; who no sooner received an account of his success, than he set out for Britain; where, having landed after a short voyage, he joined Plautius on the banks of the Thames.

15
Claudius arrives in Britain.

Soon after the arrival of Claudius, the Romans passed the Thames, attacked the British army, and totally defeated it. The consequence of this was the taking of Cunobelinus's capital, and the submission of several of the neighbouring states. The emperor, however, did not make a long stay in the island, but left Plautius to pursue his conquests. This he did with such success, that, on his return to Rome, he was met without the gates by the emperor himself, who, at his solemn entry, gave him the right hand.—The Britons seem to have made a very obstinate resistance to the Roman arms about this time. Vespasian, who was

afterwards emperor, is said to have fought 30 battles with them; and the exploits of Titus his son are also much celebrated by the Roman historians.

England.

In the ninth year of Claudius, P. Ostorius Scapula was sent into Britain. By far the greater part of the 17 nations formerly mentioned were at this time unconquered. Some of these had broken into the Roman territories; but Ostorius falling unexpectedly upon them, put great numbers to the sword, and dispersed the rest. To prevent them for the future from making inroads into the territories of the Romans or their allies, he built several forts on the Severn, the Avon, and the Nen, reducing the country south of these rivers to a Roman province. This so highly offended the Icenii, that, being joined by the neighbouring nations, they raised a considerable army, and encamped in an advantageous situation, in order to prevent the Romans from penetrating farther into the island. Ostorius, however, soon advanced against them. The Romans, as usual, got the victory, and the enemy were pursued with great slaughter. The Roman general then, having quelled an insurrection among the Brigantes, led his army against the Silures. They were headed by their king Caractacus, a most renowned warrior. He showed his military talents by choosing a very advantageous place for engaging the enemy. Tacitus tells us, "it was on the ridge of an exceeding steep mountain; and where the sides of it were inclining and accessible, he reared walls of stone for a rampart. At the foot of the mountain flowed a river dangerous to be forded, and an army of men guarded his entrenchments." This hill is thought to be one called *Caer-Caradoc* in Shropshire, situated near the conflux of the rivers Colun and Teme, and where the remains of ancient entrenchments are still visible.—On the approach of the enemy, Caractacus drew up his troops in order of battle, animating them with the following speech, according to Tacitus. "That from this day, and this battle, they must date their liberty rescued, or their slavery for ever established. He then invoked the shades of those heroes who had expelled Cæsar the dictator; those brave men by whose valour they still enjoyed freedom from Roman tribute and taxes, and by which their wives and children were as yet preserved from prostitution." The whole army then took a solemn oath either to conquer or die, and prepared for the charge with the most terrible shouts. Ostorius was somewhat dismayed when he considered the uncommon fierceness of the enemy, and the other difficulties which he had to encounter. He led on his men, however, to the charge; and the Romans were attended with their usual good fortune. The Britons were put to flight. Vast numbers fell on the field of battle and in the pursuit, and many more were taken prisoners. Among the latter were the wife, the daughter, and the brothers, of Caractacus. The unfortunate prince himself fled to Cartismundua queen of the Brigantes, by whom he was delivered up to the Roman general, who sent him in chains to Rome. Caractacus bore his misfortunes with magnanimity; and when he came before the emperor, addressed him in the following terms. "If my moderation in prosperity, O

16

Caractacus defeated and taken prisoner.

Claudius! had been as conspicuous as my birth and fortune, I should now have entered this city as a friend, and not as prisoner; nor would you have disdained the

17
His speech to the Roman emperor.

England. the friendship of a prince descended from such illustrious ancestors, and governing so many nations. My present condition, I own, is to you honourable, to me humiliating. I was lately possessed of subjects, horses, arms, and riches. Can you be surpris'd that I endeavoured to preserve them? If you Romans have a desire to arrive at universal monarchy, must all nations, to gratify you, tamely submit to servitude? If I had submitted without a struggle, how much would it have diminished the lustre of my fall, and of your victory? And now, if you resolve to put me to death, my story will soon be buried in oblivion; but if you think proper to preserve my life, I shall remain a lasting monument of your clemency.¹⁹—This speech had such an effect upon Claudius, that he immediately pardoned Caractacus and his whole family, and commanded them to be set at liberty.

The Silures, notwithstanding this terrible blow, continued the war with great vigour, and gained considerable advantages over the Romans; which so much affected Ostorius, that he died of grief. He was succeeded by A. Didius, who restrained the incursions of the Silures, but was not able to restore Cartimundua queen of the Brigantes, who had been deposed by her subjects. Didius was succeeded by Veranius, and he by Suetonius Paulinus, who reduced the island of ANGLESEY, as related under that article. But while Paulinus was employed in the conquest of this island, he was alarmed by the news of an almost universal revolt among those nations which had submitted to the Romans. The Britons, though conquer'd, had still a desire of returning to their former state of independence; and the Roman yoke became every day more unsupportable to them, through the insolence and oppressions of the Roman soldiers. The Britons had been long discontented, and were already in a very proper disposition for a revolt, when an event happened which kindled these discontents into an open flame. Prasutagus king of the Iceni, a prince renowned for opulence and grandeur, had, by his last will, left the Roman emperor, joint-heir with his two daughters, in hopes of obtaining his favour and protection by so great an obligation. But the event turned out very different. No sooner was he dead, than his houses and possessions were all plundered by the Roman soldiers. The queen Boadicea remonstrated against this injustice; but, instead of obtaining any redress, she herself was publicly whipped, her daughters ravished, and all the relations of the late king reduced to slavery. The whole country also was plundered, and all the chiefs of the Iceni deprived of their possessions.

Boadicea was a woman of too haughty a spirit tamely to bear such indignities. She therefore persuaded the Iceni to take up arms, which they very readily did. Then, being joined by the Trinobantes, and some other nations, they poured like a torrent on the Roman colonies. Every thing was destroyed with fire and sword. The ninth legion, which had been left for the defence of the country under Petilius Cerealis, was defeated, the infantry totally cut in pieces, and the commander himself with the cavalry escaped with the utmost difficulty. Suetonius, alarmed at this news, immediately left Anglesey, and marched with the greatest expedition to London. The inhabitants were overjoyed at his arrival, and used their utmost endeavours to detain

VOL. VIII. Part I.

him for their defence. But he refused to stay, and in a short time left the place, notwithstanding the intreaties of the inhabitants. The whole city lamented his departure; and they had reason. Suetonius was scarce gone, when Boadicea with her Britons entered, and destroyed all they found in it to the sword. None were taken prisoners, nor was any sex or age spared, and many were tortured in the most cruel manner. Seventy thousand persons are said to have perished on this occasion at London and other Roman colonies.

The Britons, now elated with success, assembled from all quarters in great numbers, so that Boadicea's army soon amounted to 230,000 men. They despised the Romans; and became so confident of victory, that they brought their wives and children along with them in waggons to be spectators of the destruction of their enemies. The event was what might naturally have been expected from such ill-judged confidence. The Britons were overthrown with most terrible slaughter, no fewer than 80,000 being killed in the battle and pursuit; while the Romans had not above 400 killed, and not many more wounded. Boadicea, not able to survive so great a calamity, put an end to her life by poison.

By this overthrow the Britons, who had once been subdued, were thoroughly prevented from raising any more insurrections, and even those who had not yet submitted to the Roman yoke seemed to be intimidated from making incursions into their dominions. Nothing remarkable therefore happened for some time. In the time of Vespasian, Petilius Cerealis being appointed governor of Britain, attacked the Brigantes, defeated them in several battles, and reduced great part of their country. He was succeeded by Julius Frontinus; who not only maintained the conquests of his predecessor, but reduced entirely the warlike nation of the Silures. Frontinus was succeeded by the celebrated Cneius Julius Agricola, who completed the conquest of all the southern Britons.

Just before the arrival of Agricola, the Ordovices had cut in pieces a band of horse stationed on their confines, after which the whole nation had taken arms. The summer was pretty far spent, and the Roman army was quite separated and dispersed, the soldiers having assured themselves of rest for the remaining part of the year. Agricola, however, was no sooner landed, than, having drawn together his legions, he marched against the enemy without delay. The Britons kept upon the ridges of the mountains; but Agricola led them in person up the ascents. The Romans were victorious; and such a terrible slaughter was made of the Britons, that almost the whole nation of Ordovices was cut off. Without giving the enemy time to recover from the terror which this overthrow had occasioned, Agricola resolved upon the immediate reduction of Anglesey, which had been lost by the revolt of Boadicea. Being destitute of ships, he detached a chosen body of auxiliaries who knew the fords, and were accustomed to manage their arms and horses in the water. The Britons, who had expected a fleet and transports, were so terrified by the appearance of the Roman forces on their island, that they immediately submitted, and Anglesey was once more restored to the Romans.

With the conquest of Anglesey ended the first campaign

England.

England.

19

They destroyed
70,000 Roman
mans.

20

They are
ultimately de-
feated.

21

Britain con-
quered by
Agricola

18
General re-
volt of the
Britons.

England.

paign of Agricola; and he employed the winter in reconciling the Britons to the Roman yoke. In this he met with such success, through his wife and equitable conduct, that the Britons, barbarous as they were, began to prefer a life of security and peace, to that independency which they had formerly enjoyed, and which continually exposed them to the tumults and calamities of war. The succeeding campaigns of Agricola were attended with equal success; he not only subdued the 17 nations inhabiting England, but carried the Roman arms almost to the extremity of Scotland. He also caused his fleet to sail round the island, and discovered the Orcades, or Orkney islands, which had before been unknown to the rest of the world. His expedition took him up about six years, and was completed in the year of Christ 84.

Had this commander been continued in Britain, it is probable that both Scotland and England would have been permanently subdued; but he was recalled by Domitian in the year 85, and we are then almost totally in the dark about the British affairs till the reign of the emperor Adrian. During this interval the Caledonians had taken arms, and not only refused subjection to the Roman power themselves, but ravaged the territories of the Britons who continued faithful to them. Adrian, for what reason is not well known, abandoned to them the whole tract lying between the Tyne and the Forth. At the same time, in order to restrain them from making incursions into the Roman territories, he built a wall 80 miles in length from the river Eden in Cumberland to the Tyne in Northumberland*. He was succeeded by Antoninus Pius, in whose reign the Brigantes revolted; and the Caledonians, having in several places broken down the wall built by Adrian, began anew to ravage the Roman territories. Against them the emperor sent Lollius Urbicus, who reduced the Brigantes; and having defeated the northern nations, confined them within narrower bounds by a new wall †, extending probably between the friths of Forth and Clyde. From the time of Antoninus to that of Severus, the Roman dominions in Britain continued to be much infested by the inroads of the northern nations. That emperor divided Britain into two governments, the southern and northern; but the governor of the northern division was so harassed by continual incursions of the Caledonians, that he was at length obliged to purchase a peace with money. The Caledonians kept the treaty for 15 years; after which, breaking into the Roman territories anew, they committed terrible ravages. Virius Lupus the governor, not being in a condition to withstand them, acquainted the emperor with his distress, intreating him to send powerful and speedy supplies. Upon this Severus resolved to put an end to the perpetual incursions of the enemy, by making a complete conquest of their country; for which purpose he set out for Britain, together with his two sons Caracalla and Geta, at the head of a numerous army. The Caledonians no sooner heard of his arrival, than they sent ambassadors offering to conclude a peace upon honourable terms. But these the emperor detained till he was ready to take the field, and then dismissed them without granting their request.

As soon as the season was fit for action, Severus

marched into the territories of the Caledonians, where he put all to fire and sword. He advanced even to the most northerly parts of the island; and though no battle was fought in this expedition, yet through the continual ambuscades of the enemy, and the inhospitable nature of the country, he is said to have lost 50,000 men. At last the Caledonians were obliged to sue for peace; which was granted them on condition of their yielding part of their country, and delivering up their arms. After this the emperor returned to York, leaving his son Caracalla to command the army, and finish the new wall which had been begun between the friths of Forth and Clyde. But the emperor being taken ill at York, the Caledonians no sooner heard of his indisposition, than they again took up arms. This provoked Severus to such a degree, that he commanded his son Caracalla to enter their country anew with the whole army, and to put all he met to the sword without distinction of sex or age. Before these orders, however, could be put in execution, his two sons, having concluded a shameful peace with the Caledonians, returned to Rome.

A long chasm now takes place in the history of the Roman dominions in Britain. In the beginning of Dioclesian's reign, Carausius a native of Gaul, passing over into Britain, took upon him the title of emperor, and was acknowledged by all the troops quartered here. He was, however, killed in a battle with one of Constantius's officers, after he had enjoyed the sovereignty for six or seven years. Constantine the Great began his reign in this island; and returned soon after he had left it, probably with a design to put a stop to the daily incursions of the Caledonians. He altered the division of that part of Britain subject to the Romans. Severus had divided it only into two provinces; but Constantine increased the number to three, viz. Britannia Prima, Britannia Secunda, and Maxima Cæsariensis; and this last was afterwards divided into two, viz. Maxima Cæsariensis and Flavia Cæsariensis. The removal of the imperial seat from Rome to Constantinople, which happened in the reign of Constantine, gave the northern nations an opportunity of making frequent incursions into the Roman provinces; the emperor having carried with him, first into Gaul, and then into the East, not only most of the Roman troops, but likewise the flower of the British youth.

About the latter end of the reign of Constantius son to Constantine the Great, the government of the province of Britain, and other western parts of the empire, was committed to Julian, afterwards called the apostate. While he was in his winter quarters at Paris, he was informed that the Scots and Picts, about this time first distinguished by these names, had broken into the Roman territories and committed everywhere dreadful ravages. Against them Julian dispatched a body of troops under the command of Lupicinius. He embarked from Boulogne in the depth of winter, but was no sooner arrived at London than he was recalled; the enemy having probably found means to appease Julian by their submissions. Till the reign of Valentinian I. these nations still continued to infest the Roman territories in Britain, and had now reduced the country to a most deplorable condition by their continual ravages. Valentinian sent against them Theodosius, father to the emperor of that name. That general

England.

* See Adrian.

† See Antoninus's wall.

22
Expedition of Severus into Britain.

ral

England. ral having divided his forces into several bodies, advanced against the enemy, who were roving up and down the country. The Scots and Picts were obliged to yield to the superior valour and discipline of the Romans. Great numbers were cut in pieces; they were forced to abandon all the booty and prisoners they had taken, and to retire beyond the friths of Forth and Clyde. Theodosius then entered London in triumph, and restored that city to its former splendor, which had suffered greatly by the former incursions of the northern Britons. To restrain them from breaking anew into the provinces, Theodosius built several forts or castles between the two friths; and having thus recovered all the country between Adrian's wall and the friths of Forth and Clyde, he formed of it a fifth province, which he called *Valentia*.

Though Britain was now reduced to a state of temporary tranquillity, yet as the Roman empire was daily declining, it is not to be supposed that sufficient care could be taken to secure such a distant province. In the reign of the emperor Honorius, the provincial Britons found themselves annoyed not only by the Scots and Picts, but also by the depredations of the Saxons, who began to commit ravages on the sea-coasts. By the care, however, of Stilicho, prime minister to Honorius, matters were once more settled, and a particular officer was appointed to guard the coast against the attempts of the Saxons, with the title of *Comes limitis Saxonici*. But, not long after, the empire being overrun by barbarians, most of the Roman troops quartered in Britain were recalled, and the country left quite open to the attacks of the Scots and Picts.

23 The Britons choose an emperor of their own. Upon this the provincials expecting no more assistance from Honorius, resolved to set up an emperor of their own. Accordingly they invested with the imperial dignity one *Mark*, an officer of great credit among them. Him they murdered in a few days, and placed on the throne one *Gratian* a native of Britain. After a reign of four months, *Gratian* underwent the fate of his predecessor; and was succeeded by *Constantine*, a common soldier, who was chosen merely for the sake of his name. He seems, however, to have been a man of some knowledge and experience in war. He drove the Scots and Picts beyond the limits of the Roman territories; but being elated with this success, he would now be satisfied with nothing less than the conquest of the whole Roman empire. He therefore passed over into Gaul; and took with him not only the few Roman forces that had been left, but such of the provincial Britons as were most accustomed to arms. That unhappy people, being now left entirely defenceless, were harassed in the most cruel manner by their enemies; who broke into the country, and destroyed all with fire and sword. In this miserable situation they continued from the year 407, when the usurper *Constantine* passed over into Gaul, till the year 410. Having during the last three years frequently implored assistance from Rome without receiving any, they now resolved to withdraw their allegiance from an empire which was no longer able to protect them. Honorius himself applauded their conduct; and advised them by letters to provide for their own safety, which was in effect an implicit resignation of the sovereignty of the island.

The provincial Britons now regained their liberty;

but they had lost the martial spirit which had at first rendered them so formidable to the Romans. They seem, however, to have met with some success in their first enterprises; for *Zosimus* tells us, that they delivered their cities from the insults of an haughty enemy. But being at last overpowered, they were again obliged to have recourse to the Roman emperor, to whom they promised a most perfect submission, provided they were delivered from the hands of their merciless and implacable enemies. Honorius, touched with compassion, sent a legion to their relief. The Roman forces landed in Britain unexpectedly; and having destroyed great numbers of the Scots and Picts, they drove them beyond the friths of Forth and Dunbritton. After this they advised the natives to build a wall on the isthmus from sea to sea, and to reassume their courage, and defend themselves from their enemies by their own valour. The Romans then quitted the country; being obliged to return, in order to repulse those barbarians who had broken into the empire from all quarters.

The Britons immediately set about building the wall, as they had been desired, with great alacrity. But as it was constructed only of turf, the Scots and Picts soon broke it down in several places; and, pouring in upon the defenceless and effeminate provincials, committed more cruel ravages than ever. At last, after very many and grievous calamities, the latter sent ambassadors once more to Rome. These appeared with their garments rent and dust on their herds; and at last prevailed on the emperor, by their earnest intreaties, to send another legion to their relief. The troops arrived in Britain before the enemy had the least knowledge of their having set sail. They were therefore quite unprepared for an attack, and roving up and down the country in the utmost disorder. The Romans made a terrible havock among them, and drove the remainder into their own country. As Honorius had sent them not with any ambitious view of retaining the island in subjection, but merely out of compassion to the unhappy provincials, the Romans told them, they had now no farther assistance to expect from them. They informed them, that the legion must immediately return to the continent, to protect the empire from the barbarians, who had extended their ravages almost to every part of it; and therefore, that they must now take their last farewell of Britain, and totally abandon the island. After this declaration *Gallio*, the commander of the Roman troops, exhorted the provincials to defend themselves, by fighting bravely for their country, wives, and children, and what ought to be dearer than life itself, their liberty; telling them, at the same time, that their enemies were no stronger than themselves, provided they would but lay aside their fears, and exert their ancient courage and resolution. That they might the better withstand the attacks of the enemy, he advised them to build a wall, not of turf, but of stone; offering to assist them with his soldiers, and to direct them himself in the execution. Upon this the Britons immediately fell to work; and with the assistance of the Romans, finished it in a short time, though it was no less than eight feet thick, and twelve feet in height. It is thought to have been built on the same place where *Severus's* wall formerly stood. Towers were also built at convenient

England.

26
Britain finally abandoned by the Romans.

venient distances on the east coast, to prevent the descents of the Saxons and other barbarians that came from Germany. Gallio employed the rest of his time in teaching the provincials the art of war. He left them patterns of the Roman weapons, which he also taught them to make; and after many encouraging exhortations, he took his last farewell of Britain, to which the Romans never returned. There is a great disagreement among chronologers as to the year in which the Romans finally abandoned Britain; some placing it in 422; others in 423, or 426; and some in 431, 435, or 437.

27
Britons miserably harassed by the Scots and Picts.

The final departure of the Romans was no sooner known to the Scots and Picts, than they poured in upon the provincial Britons from all quarters, like hungry wolves breaking into a sheep-fold. When the Scots approached the new built-wall, they found it completely finished, and guarded by great numbers of armed men. But so little had the provincial Britons profited by the military instructions of the Romans, that instead of placing proper guards and centinels, and relieving one another by turns, their whole number had staid several days and nights upon the ramparts without intermission. Being therefore quite benumbed and wearied out, they were able to make but very little resistance. Many were pulled down with hooks from the battlements, and dashed in pieces. The rest were driven from their stations with showers of darts and arrows. They betook themselves to flight; but that could not save them. The Scots and Picts pursued them close, made a dreadful havock among the fugitives, and took possession of the frontier towns, which they found deserted by the inhabitants. As they now met with no more opposition, they overran the whole country, putting every thing to fire and sword. Their ravages soon occasioned a famine; and this was followed by a kind of civil war. The provincials, unable to support themselves, were obliged to plunder each other of the little the common enemy had left them. The whole country at last became so incapable of supporting those who were left in it, that many fled into the woods, in order to subsist themselves there by hunting.

28
Implore the assistance of the Romans.

In this extremity of distress they had once more recourse to the Romans; and wrote in the most mournful style that can possibly be imagined to Aetius, who was then consul the third time. Their letter they directed thus: "The groans of the Britons to the consul Aetius." The contents of this letter were answerable to the direction. "The barbarians (say they) drive us to the sea; the sea drives us back to the barbarians; between which we have only the choice of two deaths, either to be swallowed up by the waves, or to be cruelly massacred by the enemy."

29
They at last repulse their enemies.

To this letter the Roman general gave no satisfactory answer, and the provincials were thereupon reduced to despair. Great numbers of them fled over to Armorica, where they settled along with others who had formerly gone over with an usurper called *Maximus*; while others submitted to the Scots and Picts. Some, however, more resolute than the rest, had once more recourse to arms. They sallied out in parties from the woods and caves where they had been obliged to hide themselves, and, falling unexpectedly on the enemy, cut great numbers of them in pieces, and obliged the rest to retire. Having thus obtained some respite,

they began again to cultivate their lands; which, having lain fallow for a long time, now produced all sorts of corn in the greatest plenty. This plenty, according to the historian Gildas, occasioned the most consummate wickedness and corruption of manners among all ranks of men. The clergy, says he, who should have reclaimed the laity by their example, proved the ringleaders in every vice; being addicted to drunkenness, contention, envy, &c.—It is possible, however, that this description might be exaggerated by Gildas, who was himself a monk. But however this was, the Britons had not long enjoyed peace, when they were alarmed by a report, that the Scots and Picts were about to return with a far greater force than before, utterly to extirpate the name of their southern neighbours, and seize upon the country for themselves. This report threw them into a terrible consternation; and to add to the rest of their misfortunes, they were now visited by a dreadful plague, which raged with such violence, that the living were scarce sufficient to bury the dead. The contagion no sooner ceased, than they found their country invaded by the Scots and Picts, who destroyed every thing with fire and sword; so that the provincials were soon reduced to the same miserable state they had formerly been in.

England.

30
Are again threatened with an invasion.

At this time the chief, if not the only, king of the southern division of Britain, was one *Vortigern*. He is said to have been a cruel, debauched tyrant, regardless of the public welfare, and totally incapable of promoting it. Being now roused from his insensibility, however, by a sense of his own danger, he summoned a council of the chief men of the nation, in order to deliberate about the proper means for delivering the country from those calamities under which it groaned. In this council the most pernicious measure was adopted that could possibly have been resolved on; namely, to invite to their assistance the *Saxons*, a people famous for their piracies and cruelty, and justly dreaded by the Britons themselves*. This fatal expedient being agreed upon, ambassadors were immediately dispatched into Germany with advantageous proposals to the Saxons in case they would come over to their assistance.

31
They resolve to call in the Saxons. * See Saxons.

The British ambassadors soon arrived in Germany, and, according to Witichind, a Saxon historian of the ninth century, made the following speech before an assembly of the Saxons.—"Illustrious Saxons, the fame of your victories having reached our ears, the distressed Britons, harassed by the continual inroads of a neighbouring enemy, send us to implore your assistance. We have a fertile and spacious country, which we are commanded to submit to you. We have hitherto lived under the protection of the Roman empire; but our ancient masters having abandoned us, we know no nation more powerful than you, and better able to protect us. We therefore recur to your valour. Forgive us not in our distress, and we shall readily submit to what terms you yourselves shall think fit to prescribe to us."—If this abject and shameful speech was really made, it must give us a very strange idea of the national spirit of the provincial Britons at that time. It is, however, probable that the whole is a fiction, designed only to excuse the perfidious treatment which these Britons afterwards received from the Saxons.

^{England.} Saxons. The most respectable even of the Saxon historians make no mention of such a speech; and it is certain, that when the Saxons themselves wanted to quarrel with the Britons, they never insisted upon the promise made by the British ambassadors; which they most certainly would have done, had any such promise ever been made.

The British ambassadors were very favourably received by the Saxons. The latter embraced their proposal with joy; and the rather, because their soothsayers foretold that they should plunder their British allies for 150 years, and reign over them for twice that time. Three long ships, in the Saxon language called *chiules*, were therefore fitted out, under the conduct of Hengist and Horfa. These were two brothers much celebrated both for their valour and nobility. They were sons of Witigifil, said to be great-grandson to the Saxon god Woden; a circumstance which added much to their authority. Having embarked about 1600 men on board their three vessels, the two brothers arrived in the isle of Thanet, in the year 449 or 450. They were received by the inhabitants with the greatest demonstrations of joy: the isle in which they had landed was immediately appointed for their habitation; and a league was concluded, in virtue of which the Saxons were to defend the provincial Britons against all foreign enemies; and the provincials were to allow the Saxons pay and maintenance, besides the place allotted them for their abode. Soon after their arrival, King Vortigern led them against the northern nations, who had lately broke into the kingdom, and advanced as far as Stanford in the county of Lincolnshire. Here a battle was fought, in which the Scots and Picts were utterly defeated, and obliged to relinquish their booty.

³²
The Saxons arrive in Britain, and defeat the Scots and Picts.

Vortigern was so highly pleased with the behaviour of his new allies, that he bestowed large possessions in the country they had newly delivered, upon the two commanders Hengist and Horfa. It is said, that, even at this time, Hengist was taken with the wealth and fertility of the country; and at the same time observing the inhabitants to be quite enervated with luxury, began to entertain hopes of conquering part of it. He therefore, with Vortigern's consent, invited over some more of his countrymen; giving them notice at the same time of the fruitfulness of the country, the effeminacy of the inhabitants, and how easily a conquest might be effected.

³³
New supplies of Saxons arrive.

The Saxons readily complied with the invitation; and, in 452, as many more arrived in 17 vessels, as, with those already in Britain, made up an army of 5000 men. Along with these, according to Nennius, came over Rowena the daughter of Hengist. Vortigern fell in love with this lady; and in order to obtain her in marriage, divorced his lawful wife. Hengist pretended to be averse to the match; but Vortigern obtained his consent by investing him with the sovereignty of Kent. The Saxon historians, indeed, make no mention of Rowena; but rather insinuate, that their countrymen made themselves masters of Kent by force of arms. It seems most probable, however, that Vortigern had as yet continued in friendship with the Saxons, and even put more confidence in them than in his own subjects. For, not long after the arrival of this first reinforcement, Hengist obtained leave to send

for a second, in order, as was pretended, to defend the king from the attempts of his rebellious subjects, as well as of the Scots and Picts. These embarked in 40 ships, under the command of Osta and Ebusa, the son and nephew, or, according to some, the brother and nephew of Hengist. They landed at the Orkney islands; and having ravaged them, as well as all the northern coasts of Scotland, they conquered several places beyond the Frith, and at last obtained leave to settle in Northumberland.

The pretence made for this settlement was, that the Saxons under Osta and Ebusa might defend the northern frontiers of the kingdom, as those under Hengist and Horfa did the southern parts. Many more Saxons were, under various pretences, invited over; till at last the countries from which they came were in a manner depopulated. And now their numbers being greatly increased, the Saxons began to quarrel with the natives. They demanded larger allowances of corn, and other provisions; threatening to lay waste the whole country if their demands were not complied with. The Britons, instead of complying with these demands, desired them to return home, since their numbers exceeded what they were able to maintain. Upon this, the Saxons concluded a peace with the Scots and Picts; and, turning their arms against the unhappy provincials, overran the whole country. The Saxons committed everywhere the greatest cruelties. All buildings, whether public or private, they levelled with the ground. The cities were pillaged and burnt; and the people massacred without distinction of sex or age, and that in such numbers, that the living scarce sufficed to bury the dead. Some of those who escaped the general slaughter, took refuge among inaccessible rocks and mountains; but there great numbers perished with hunger, or were forced to surrender themselves as slaves to their enemies. Some crossed the sea and settled either in Holland or in Armorica, now the province of Brittany in France.

Vortigern, we are told by Nennius, was so far from being reclaimed by these calamities, that he added incest to his other crimes, and married his own daughter. At last, his own subjects, provoked at his enormous wickedness, and the partiality he showed to the Saxons, deposed him, and raised his son Vortimer to the throne. He was a young man of great valour, and willingly undertook the defence of his distressed country. He first fell upon the Saxons with what troops he could assemble, and drove them into the isle of Thanet. Here they were besieged, till, being reinforced by fresh supplies from Germany, they opened themselves a way through the British troops. Vortimer, however, was not yet disheartened. He engaged the Saxons on the banks of the Derwent in Kent, where he obtained a complete victory, and cut in pieces great numbers of the enemy. Another battle was fought at Aylesford in Kent. Some ascribe the victory at this time to the Saxons, and some to the Britons. It is certain, however, that Horfa the brother of Hengist was killed in this engagement. He is said to have been buried at a place in the neighbourhood, which from him obtained the name of *Horsted*.—A third battle was fought, in which the victory was uncertain, as is also the place where it happened. The fourth battle, however, according to Nennius proved decisive

^{England.}

³⁴
They quarrel with the Britons.

³⁵
They are defeated and driven out by Vortimer.

England. decisive in favour of the Britons. Vortimer engaged his enemies, according to some, at Folkstone, according to others, at a place called *Stonar*, in the isle of Thanet. The Saxons were defeated with great slaughter, and driven back to their ships. So complete is the victory said to have been, that the Saxons quitted the island, without making any attempt upon it for five years afterwards. These battles, however, rest entirely upon the credit of Nennius, and the historians who have followed him. They are taken notice of neither by Gildas nor Bede. The former only acquaints us, that the Saxons retired. This, by most historians, is understood of their returning home; though it is possible he might mean no more, than that, after they had laid waste the country, they retired into the territories allotted them by Vortigern, in Kent and Northumberland.

36
They return and defeat the Britons, and erect a kingdom in Kent.

Vortimer is said to have died after a reign of six years. On his death-bed, he desired his servants to bury him near the place where the Saxons used to land; being persuaded, that the virtue of his bones would effectually prevent them from ever touching the British shore. This command, however, was neglected; and Vortimer was buried at Lincoln, according to some, or London, according to others. Hengist was no sooner informed of his death, than he invaded Britain anew with a numerous body of Saxons. He was opposed by Vortigern, who had been restored to the throne after the death of his son Vortimer. Several battles were fought on this occasion; but at last the provincials being overthrown at a place called *Crecaford*, with the loss of 4000 men, were obliged to abandon Kent to their enemies, and retire to London. This happened about the year 458 or 459; and from this time most historians date the erection of the first Saxon kingdom in Britain, viz. that of Kent. Hengist assumed the title of *king*, and chose Elk his son for his colleague.

37
Treachery of the Saxons.

The Britons under Vortigern still continued the war. Hengist finding himself unable to gain a decisive advantage over them in the field, had recourse to treachery. He pretended to be desirous of concluding a peace with the British monarch, and of renewing his ancient friendship with him; and therefore required an interview. To this Vortigern readily consented, and accepted of an entertainment prepared for him by Hengist. The king was attended by 300 nobility all unarmed; but the Saxons had concealed daggers below their garments. The British nobility were all treacherously massacred in the height of their mirth; Vortigern himself was taken and put in fetters; nor could his liberty be procured, but by ceding to the Saxons those provinces now called *Essex*, *Suffex*, and *Middlesex*. Thus the Saxons got such a footing in Britain, that they could never afterwards be expelled. Vortigern, after being set at liberty, is said to have retired to a vast wilderness near the fall of the Wye in Radnorshire, where he was some time after consumed by lightning, together with a city called *Kaer Gourtigern* which he had built in that place.

On the retreat of Vortigern, the command of the British forces devolved upon Aurelius Ambrosius, or as Gildas calls him, Ambrosius Aurelianus. He was a Roman, and perhaps the last that remained in the island. He is said to have gained several victories over the

Saxons. Notwithstanding this, however, they still continued to gain ground; and in the year 491, the foundation of a second Saxon kingdom was laid in Britain. This at first comprehended only the county of *Suffex*, but soon after extended over most of the counties lying south of the Humber. It was called the *kingdom of the South Saxons*.

England.
38
Second Saxon kingdom.

The German nations being now informed of the good success which had attended the Saxons in Britain, new adventurers daily flocked over to share the good fortune of the others. They were chiefly composed of three nations, the Saxons, Angles, and Jutes. All these passed under the common appellation sometimes of *Saxons*, sometimes of *Angles*. They spoke the same language, and agreed very much in their customs and institutions, so that all of them were naturally led to combine against the natives. The most active of these adventurers was Cerdic a Saxon, said to be the tenth in descent from Woden. He landed with his son Cenric, and as many men as he could convey in five ships, at Yarmouth in Norfolk. The provincials immediately attacked him with great vigour; but after a short engagement, they were totally defeated. Many other battles were fought, the event of which was always favourable to the Saxons, so that the Britons were forced to abandon their sea-coasts to them.

In 497, *Porta*, another Saxon, with his two sons *Bleda* and *Magla*, arrived at *Portsmouth*, so called, as some imagine, from this chieftain. The provincials, under the command of a young prince a native of the country, attempted to oppose the landing of the Saxons; but his army was defeated with great slaughter, and he himself killed in the engagement; after which *Porta* made himself master of all the neighbouring country. The progress of Cerdic, however, alarmed the Britons more than that of all the other Saxon princes. About the year 508, therefore, *Nazaleod*, styled, by Henry of Huntingdon, the *greatest of all the British kings*, assembled almost the whole strength of the provincial Britons in order to drive him out of the island. Cerdic, on the other hand, took care to strengthen himself by procuring assistance from all the Saxons already in the island. He then advanced against the Britons, commanding the right wing himself, and his son Cenric the left. As the two armies drew near each other, *Nazaleod* perceived the enemy's right wing to be much stronger than the left. He therefore attacked it with the flower of his army; and after an obstinate resistance, obliged Cerdic to save himself by flight. Being too eager in the pursuit, however, Cenric fell upon his rear, and the battle was renewed with great vigour. The British army was at last entirely defeated; and 5000 men, among whom was *Nazaleod* himself, were left dead on the spot.

39
Nazaleod king of Britain defeated and killed.

Who succeeded *Nazaleod* in the kingdom of Britain, is not known. The Welsh annals leave an interregnum of about six years, after which they place the beginning of the reign of Arthur, the most renowned British prince mentioned in history. The history of King Arthur is so much obscured by fables, and many such a person as King Arthur ever existed. On this subject Milton gives the following reasons against the existence of King Arthur: 1. He is not mentioned by Gildas,

40
Whether such a person as King Arthur ever existed.

England. Gildas, or any British historian except Nennius, who is allowed on all hands to have been a very credulous writer, and to have published a great many fables. 2. Though William of Malmesbury and Henry of Huntingdon have both related his exploits, yet the latter took all he wrote from Nennius; and the former, either from the same fabulous writer, or some monkish legends in the abbey of Glastenbury; for both these writers flourished several centuries after King Arthur. 3. In the pretended history of Geoffroy of Monmouth, such contradictions occur concerning this monarch's victories in France, Scotland, Ireland, Norway, Italy, &c. as must cause us to look upon him as a hero altogether fabulous and romantic.

In answer to this it has been said, 1. That his not being mentioned by Gildas cannot seem strange to us, seeing it was not that author's design to write an exact history of his country, but only to give a short account of the causes of its ruin by the Scots, Picts, and Saxons. He had also a particular system to support, namely, That the ruin of the Britons was owing to the judgements of God upon them for their wickedness. He lies therefore under a great temptation to conceal the successes of the Britons, and to relate only their misfortunes. 2. Though Nennius was a credulous writer, it is unreasonable to think that the whole history of King Arthur was an invention of his. It is more probable that he copied it from other more ancient authors, or took it from the common tradition of his countrymen. That the Saxon annals make no mention of this king is not to be wondered at, seeing it is natural to think that they would wish to conceal the many defeats he gave their nation. 3. The most convincing proof of the existence of King Arthur is, that his tomb was discovered at Glastenbury in Somersetshire, and his coffin dug up, in the reign of Henry II. with the following inscription upon it in Gothic characters: "Hic jacet sepultus inclytus rex Arturius in insula Avalonia." We are told that on his body were plainly to be seen the marks of 10 wounds, only one of which seemed to be mortal.

This renowned prince is said to have defeated the Saxons under Cerdic in 12 pitched battles. The last of these was fought on Badon-hill, supposed to be Banfdown near Bath; in which the Saxons received such a terrible overthrow, that for many years they gave the Britons no further molestation. As new supplies of Saxons, however, were continually flocking over, a third and fourth kingdom of them were soon formed. The third kingdom comprehended the counties of Devon, Dorset, Somerset, Wiltshire, Hampshire, and Berkshire; to which was afterwards added Cornwall. This was called the *kingdom of the West Saxons*. The other kingdom, which was called the *kingdom of the East Saxons*, comprehended Essex, Middlesex, and part of Hertfordshire.

In the year 542, happened the death of the great King Arthur, said to have been killed in battle with a treacherous kinsman of his own. Five years afterwards was erected the Saxon kingdom of Northumberland. It extended, however, much farther than the present bounds of that county; for it comprehended all Yorkshire, Lancashire, Durham, Cumberland, Westmorland, and Northumberland, with part of Scotland, as far as the frith of Forth. Between the Saxon

England. kings frequent contentions now arose; by which means the Britons enjoyed an uninterrupted tranquillity for at least 44 years. This interval, however, according to Gildas, they employed only in corrupting their manners more and more, till at last they were roused from their security by the setting up of a sixth Saxon kingdom, called the kingdom of the *East Angles*. It was founded in 575, and comprehended the counties of Norfolk, Suffolk, Cambridgeshire, and the Isle of Ely. The Saxons once more attacked the Britons, and overthrew them in many battles. The war was continued for ten years; after which, another Saxon kingdom called *Mercia* was set up. It comprehended 17 counties; viz. Gloucester, Hereford, Worcester, Warwick, Leicester, Rutland, Northampton, Lincoln, Huntingdon, Bedford, Buckingham, Oxford, Stafford, Nottingham, Derby, Shropshire, Cheshire, and part of Hertfordshire.

The provincial Britons were now confined within very narrow bounds. However, before they entirely gave up the best part of their country to their enemies, they once more resolved to try the event of a battle. At this time they were assisted by the Angles, who were jealous of the overgrown power of the West Saxons. The battle was fought in Wiltshire, at Woden's Bearth, a place near the ditch called *Wansdike* or *Wodensdike*; which runs through the middle of the county. The battle was very obstinate and bloody; but at last the Saxons were entirely defeated, and almost their whole army cut off. The victory, however, proved of little service to the Britons: for being greatly inferior in number to the Saxons, and harassed by them on the one side, and by the Scots and Picts on the other, they were daily more and more confined; and at last obliged to take refuge among the craggy and mountainous places in the west of the island, where their enemies could not pursue them. At first they possessed all the country beyond the rivers Dee and Severn, which anciently divided Cambria, or Wales, from England; the towns which stand on the eastern banks of these rivers having mostly been built in order to restrain the incursions of the Welsh. But the English, having passed the Severn, by degrees seized on the country lying between that river and the Wye. Nay, in former times, some parts of Flintshire and Denbighshire were subject to the kings of Mercia: for Uffa, the most powerful king of that country, caused a deep ditch to be drawn, and a high wall built, as a barrier between his dominions and the territories of the Welsh, from the mouth of the Dee, a little above Flint-castle, to the mouth of the Wye. This ditch is still to be seen in several places; and is called by the Welsh *Claudh Uffa*, or the Ditch of Uffa. The inhabitants of the towns on the east side of this ditch are called by the same people *Guyr y Mers*; that is, the men of Mercia.

Thus, after a violent contest of near 150 years, the Saxons entirely subdued the Britons whom they had come to defend, and had erected seven independent kingdoms in England, now commonly denominated the *Saxon Heptarchy*. By these conquerors the country was now reduced to a degree of barbarity almost as great as it had been in when first invaded by the Romans. The provincial Britons, during their subjection to that people, had made considerable advances in civilization.

41
His exploits.

42
Two other Saxon kingdoms erected.

43
The Britons defeat the Saxons, but are obliged to retire into Wales.

44
Accounts of the heptarchy.

England. villization. They had built 28 considerable cities, besides a number of villages and country-seats; but now these were all levelled with the ground, the native inhabitants who remained in England were reduced to the most abject slavery, and every art and science totally extinguished among them.

Before these fierce conquerors could be civilized in any degree, it was necessary that all the seven kingdoms should be reduced under one head; for as long as they remained independent, their continual wars with each other still kept them in the same state of barbarity and ignorance.

The history of these seven kingdoms affords no event that can be in the least interesting. It consists only of a detail of their quarrels for the sovereignty. This was at last obtained by Egbert king of the West Saxons, or Wessex, in 827. Before this time, Christianity had been introduced into almost all the kingdoms of the heptarchy; and however much corrupted it might be by coming through the impure channel of the church of Rome, and misunderstood through the ignorance of those who received it, it had considerably softened the barbarous manners of the Saxons. It had also opened a communication between Britain and the more polite parts of Europe, so that there was now some hope of the introduction of arts and sciences into this country. Another effect was, that, by the ridiculous notions of preserving inviolable chastity even between married people, the royal families of most of the kingdoms were totally extinct; and the people, being in a state of anarchy, were ready to submit to the first who assumed any authority over them.

All these things contributed to the success of Egbert in uniting the heptarchy under his own dominion. He was of the royal family of Wessex; and a nearer heir than Brithric, who had been raised to the kingdom in 784. As Egbert was a prince of great accomplishments, Brithric, knowing that he had a better title to the crown than himself, began to look upon him with a very jealous eye. Young Egbert, sensible of his danger, privately withdrew to France; where he was well received by Charlemagne, the reigning monarch. The French were reckoned at this period the most valiant and polite people in Europe; so that this exile proved of great service to Egbert.

He continued at the court of France till he was recalled by the nobility to take possession of the kingdom of Wessex. This recal was occasioned by the following accident. Brithric the king of Wessex had married Eadburga, natural daughter of Offa king of Mercia; a woman infamous for cruelty and incontinence. Having great influence over her husband, she often persuaded him to destroy such of the nobility as were obnoxious to her; and where this expedient failed, she herself had not scrupled to become their executioner. She had mixed a cup of poison for a young nobleman, who had acquired a great share of her husband's friendship: but, unfortunately, the king drank of the fatal potion along with his favourite, and soon after expired. By this and other crimes Eadburga became so odious to the people, that she was forced to fly into France, while Egbert was at the same time recalled, as above-mentioned.

Egbert ascended the throne of Wessex in the year

799. He was the sole descendant of those conquerors who first invaded Britain, and who derived their pedigree from the god Woden. But though this circumstance might have given him great advantages in attempting to subdue the neighbouring kingdoms, Egbert for some time gave them no disturbance; but turned his arms against the Britons, who had retired into Cornwall, whom he defeated in several battles. He was recalled from his conquests in that country, by hearing that Bernulf king of Mercia had invaded his dominions. Egbert quickly led his army against the invaders, whom he totally defeated at Edendun in Wiltshire. He then entered their kingdom on the side of Oxfordshire with an army, and at the same time sent his eldest son Ethelwolf with another into Kent. The young prince expelled Baldred the tributary king of Kent, and soon made himself master of the country. The kingdom of Essex was conquered with equal ease; and the East Angles, who had been reduced under subjection by the Mercians, joyfully put themselves under the protection of Egbert. Bernulf himself marched against them, but was defeated and killed; and Ludecan his successor met with the same fate two years after.

These misfortunes greatly facilitated the reduction of Mercia. Egbert soon penetrated into the very heart of the Mercian territories, and gained an easy victory over a dispirited and divided people; but in order to engage them to submit with the less reluctance, he allowed Wiglaf, their countryman, to retain the title of king, whilst he himself exercised the real power of a sovereign. Northumberland was at present in a state of anarchy: and this tempted Egbert to carry his victorious arms into that kingdom also. The inhabitants, being desirous of living under a settled form of government, readily submitted, and owned him for their sovereign. To them, however, he likewise allowed the power of electing a king; who paid him a tribute, and was dependent on him.

Egbert became sole master of England about the year 827. A favourite opportunity was now offered to the Anglo-Saxons of becoming a civilized people, as they were at peace among themselves, and seemed free from any danger of a foreign invasion. But this flattering prospect was soon overcast. Five years after Egbert had established his new monarchy, the Danes landed in the isle of Shepey, plundered it, and then made their escape with safety. Encouraged by this success, next year they landed from a fleet of 35 ships. They were encountered by Egbert at Charmouth in Dorsetshire. The battle was obstinate and bloody. Great numbers of the Danes were killed, but the rest made good their retreat to their ships. They next entered into an alliance with the Britons of Cornwall; and landing two years after in that country, they made an irruption into Devonshire. Egbert met them at Hengedown, and totally defeated them; but before he had time to form any regular plan for the defence of the kingdom, he died, and left the government to his son Ethelwolf.

The new king was weak and superstitious. He began with dividing the kingdom, which had so lately been united, with his son Athelstan. To the young prince he gave the counties of Essex, Kent, and Suffex. But though this division might have been productive

England. of bad consequences at another time, the fear of the Danes kept every thing quiet for the present. These barbarians had some how or other conceived such hopes of enriching themselves by the plunder of England, that they scarce ever failed of paying it an annual visit. The English historians tell us, that they met with many severe repulses and defeats; but on the whole it appears that they had gained ground: for in 851 a body of them took up their winter-quarters in England. Next year they received a strong reinforcement of their countrymen in 350 vessels; and advancing from the isle of Thanet, where they had stationed themselves, they burnt the cities of London and Canterbury. Having next put to flight Brictric the governor of Mercia, they marched into the heart of Surry, laying waste the whole country through which they passed.

Ethelwolf, though naturally little fitted for military enterprises, was now obliged to take the field. He marched against the Danes at the head of the West Saxons, and gained an indecisive and bloody victory over his enemies. The Danes still maintained their settlement in the isle of Thanet. They were attacked by Ealher and Huda, governors of Kent and Surry: both of whom they defeated and killed. Afterwards they removed to the isle of Shepey, where they took up their winter-quarters, with a design to extend their ravages the next year.

The deplorable state of the kingdom did not hinder Ethelwolf from making a pilgrimage to Rome, whither he carried his fourth and favourite son Alfred, then only six years of age. He passed a twelvemonth in that city; made presents to the principal ecclesiastics there; and made a grant of 300 mancuses (a silver coin about the weight of our half-crown) annually to the see of Rome. One-third of this was to support the lamps of St Peter's, another those of St Paul's, and the third was for the Pope himself. In his return to England, Ethelwolf married Judith, daughter of the emperor Charles the Bald; but when he landed, he found himself deprived of his kingdom by his son Ethelbald. That prince assumed the government of Athelstan's dominions, who was lately dead; and, with many of Ethelwolf's nobles, formed a design of excluding him from the throne altogether, on account of his weaknesses and superstitions. Ethelwolf, however, delivered the people from the calamities of a civil war, by dividing the kingdom with his son. He gave to Ethelbald the government of the western, and reserved to himself that of the eastern, part of the kingdom. Immediately after this, he summoned the states of the whole kingdom, and conferred on the clergy a perpetual donation of tythes, for which they had long contended, and which had been the subject of their sermons for several centuries.

This concession was deemed so meritorious by the English, that they now thought themselves sure of the favour of heaven; and therefore neglected to use the natural means for their safety which they might have done. They even agreed, that, notwithstanding the desperate situation of affairs at present, the revenues of the church should be exempted from all burdens, though imposed for the immediate security and defence of the nation. Ethelwolf died two years after he had made the above-mentioned grant, and left the

VOL. VIII. Part I.

kingdom to his two eldest sons Ethelbald and Ethelbert. Both these princes died in a few years, and left the kingdom to Ethered their brother, in the year 866. England.

The whole course of Ethered's reign was disturbed ⁴⁸ Ethered. by the irruptions of the Danes. The king defended himself against them with great bravery, being seconded in all his military enterprises by his younger brother Alfred, who afterwards ascended the throne. In this reign, the Danes first landed among the East Angles. That people treacherously entered into an alliance with the common enemy; and furnished them with horses, which enabled them to make an irruption into Northumberland. There they seized upon the city of York. Osbriht and Aella, two Northumbrian princes who attempted to rescue the city, were defeated and killed. Encouraged by this success, the Danes penetrated into the kingdom of Mercia, took up their winter-quarters at Nottingham, and thus threatened the kingdom with a final subjection. From this post, however, they were dislodged by Ethered and Alfred, who forced them to retire into Northumberland. Their restless and savage disposition, however, did not suffer them to continue long in one place. They broke into East Anglia; defeated and took prisoner Edmund the tributary king of that country, whom they afterwards murdered; and committed everywhere the most barbarous ravages. In 871, they advanced to Reading; from whence they infested the neighbouring country by their incursions. The Mercians, desirous of recovering their independency, refused to join Ethered with their forces; so that he was obliged to march against the Danes, attended only by the West Saxons, who were his hereditary subjects. Several actions ensued, in which the Danes are said to have been unsuccessful; but being continually reinforced from their own country, they became every day more and more formidable to the English. During the confusion and distress in which the nation was now necessarily involved, King Ethered died of a wound he had received in an action with the Danes; and left to his brother Alfred the kingdom almost totally subdued by a foreign power.

Alfred, who may properly be called the founder of ⁴⁹ Alfred the the English monarchy, ascended the throne in the year Great. 871, being then only 22 years of age. His great virtues and shining talents saved his country from ruin, which seemed almost unavoidable. His exploits against the Danes, his dangers and distresses, are related under the article ALFRED. Having settled the nation in a much better manner than could have been expected, he died in 901, leaving the kingdom to his second son Edward the Elder.

The beginning of this monarch's reign was disturbed ⁵⁰ Edward the by those intestine commotions from which the wise and elder. politic Alfred had taken so much pains to free the nation. Ethelwald, son to King Ethelbert, Alfred's elder brother, claimed a right to the throne. Having armed his partisans, he took possession of Winburne, where he seemed determined to hold out to the last extremity. On the approach of Edward, however, with a powerful army, he first fled into Normandy, and afterwards into Northumberland. He hoped to find the Northumbrians ready to join him, as most of them were Danes, lately subdued by Alfred, and very impatient of peace. The event did not disappoint his expectations.

H

^{England.} expectations. The Northumbrians declared for him; and Ethelwald having thus connected himself with the Danish tribes, went beyond sea, whence he returned with a great body of these banditti. On his return, he was joined by the Danes of East Anglia and Mercia. Ethelwald, at the head of the rebels, made an irruption into the counties of Gloucester, Oxford, and Wilts; and having ravaged the country, retired with his booty before the king could approach him. Edward, however, took care to revenge himself, by conducting his forces into East Anglia, and ravaging it in like manner. He then gave orders to retire; but the Kentish men, greedy of more plunder, staid behind, and took up their quarters at Bury. Here they were assaulted by the Danes; but the Kentishmen made such an obstinate defence, that though their enemies gained the victory, it was bought by the loss of their bravest men, and, among the rest, of the usurper Ethelwald himself.

The king, now freed from the attempts of so dangerous a rival, concluded an advantageous peace with the East Angles. He next set about reducing the Northumbrians; and for this purpose equipped a fleet, hoping that thus they would be induced to remain at home to defend their own country, without attempting to invade his territories. He was disappointed in his expectations. The Northumbrians were more eager to plunder their neighbours than to secure themselves. Imagining that the whole of Edward's forces were embarked on board his fleet, they entered his territories with all the troops they could raise. The king, however, was better prepared for them than they had expected. He attacked them on their return at Tetenhall in the county of Stafford, put them to flight, recovered all the booty, and pursued them with great slaughter into their own country.

The rest of Edward's reign was a scene of continued and successful action against the Northumbrians, East Angles, the Danes of Mercia, and those who came from their native country in order to invade England. He put his kingdom in a good posture of defence, by fortifying the towns of Chester, Eddesbury, Warwick, Cherbury, Buckingham, Towcester, Maldon, Huntingdon, and Colchester. He vanquished Thurketill a Danish chieftain, and obliged him to retire with his followers into France. He subdued the East Anglians, Northumbrians, and several tribes of the Britons; and even obliged the Scots to make submissions. He died in 925, and was succeeded by Athelstan his natural son.

⁵¹
Athelstan.

This prince, notwithstanding his illegitimate birth, ascended the throne without much opposition, as the legitimate children of Edward were too young to rule a nation so much liable both to foreign invasions and domestic troubles as England at present was. One Alfred, however, a nobleman of considerable power, entered into a conspiracy against him. It is said, that this nobleman was seized upon strong suspicions, but without any certain proof. He offered to swear to his innocence before the pope; and in those ages it was supposed that none could take a false oath in presence of such a sacred person, without being visited by an immediate judgment from God. Alfred was accordingly conducted to Rome, and took the oath required of him before Pope John. The words were no sooner

pronounced, than he fell into convulsions, of which he ^{England.} expired in three days. The king, fully convinced of his guilt, confiscated his estate, and made a present of it to the monastery of Malmesbury.

This accident proved the means of establishing the authority of Athelstan in England. But finding the Northumbrians bore the English yoke with impatience, he gave Sithric, a Danish nobleman, the title of king of Northumberland; and in order to secure his friendship, gave him his own sister Editha in marriage. This was productive of bad consequences. Sithric died the year after his marriage with Editha; upon which Anlaf and Godfrid, Sithric's sons by a former marriage, assumed the sovereignty without waiting for Athelstan's consent. They were, however, soon obliged to yield to the superior power of that monarch. The former fled to Ireland; and the latter to Scotland, where he was protected by Constantine king of that country. The Scottish monarch was continually importuned by Athelstan to deliver up his guest, and even threatened with an invasion in case he did not comply. Constantine, detesting this treachery, advised Godfrid to make his escape. He did so, turned pirate, and died soon after. Athelstan, however, resenting this conduct of Constantine, invaded his kingdom, and reduced him, it is said, so low, that he was obliged to make the most humble submissions. This, however, is denied by all the Scottish historians.

Constantine, after the departure of Athelstan, entered into a confederacy with Anlaf, who subsisted by his piracies, and with some of the Welsh princes who were alarmed at the increase of Athelstan's power. All these confederates made an irruption into England at once; but Athelstan meeting them at Brumsbury in Nor-⁵²thumberland, gave them a total overthrow. Anlaf ^{Defeats his} and Constantine made their escape with difficulty, leaving the greatest part of their men dead on the field of battle. After this period, Athelstan enjoyed his crown in tranquillity. He died in 941, after a reign of 16 years. He passed a remarkable law, for the encouragement of commerce: viz. that a merchant, who had made three long sea voyages on his own account, should be admitted to the rank of a thane or gentleman.

Athelstan was succeeded by his brother Edmund.⁵³ On his accession, he found the kingdom disturbed by the restless Northumbrians, who watched for every opportunity of rising in rebellion. They were, however, soon reduced; and Edmund took care to ensure the peace of the kingdom, by removing the Danes from the towns of Mercia where they had been allowed to settle, because it was found that they took every opportunity to introduce foreign Danes into the kingdom. He also conquered Cumberland from the Britons. This country, however, he bestowed upon Malcolm king of Scotland, upon condition that he should do homage for it, and protect the north of England from all future incursions of the Danes.

Edmund was unfortunately murdered in Gloucester, ⁵⁴Murdered by one Leolf a notorious robber. This man had been by Leolf. formerly sentenced to banishment; yet had the boldness to enter the hall where the king himself dined, and to sit at table with his attendants. Edmund immediately ordered him to leave the room. The villain refused to obey; upon which the king leaped upon him,

^{England.} him, and seized him by the hair. Leolf then drew a dagger, and gave the king a wound, of which he instantly died, A. D. 946, being the sixth year of his reign.

⁵⁵
Edred.

As the children of Edmund were too young at the time of his decease, his brother Edred succeeded to the throne. The beginning of his reign, as well as those of his predecessors, was disturbed by the rebellions and incursions of the Northumbrian Danes, who looked upon the succession of every new king to be a favourable opportunity for shaking off the English yoke. On the appearance of Edred with an army, however, they immediately submitted: but before the king withdrew his forces, he laid waste their territories as a punishment for their offence. He was no sooner gone, than they rose in rebellion a second time. They were again subdued; and the king took effectual precautions against their future revolts, by placing English garrisons in all their towns, and appointing an English governor to watch their motions, and suppress their insurrections on the first appearance. In the reign of Edred, celibacy of the clergy began to be preached up under the patronage of St DUNSTAN. This man had obtained such an ascendant over Edred, who was naturally superstitious, that he not only directed him in affairs of conscience, but in the most important matters of state. He was placed at the head of the treasury; and being thus possessed of great power at court, he was enabled to accomplish the most arduous undertakings. He professed himself a partisan of the rigid monastic rules; and having introduced celibacy among the monks of Glasterbury and Abingdon, he endeavoured to render it universal among the clergy throughout the kingdom. The monks in a short time generally embraced the pretended reformation; after which they inveighed bitterly against the vices and luxury of the age. When other topics of defamation were wanting, the marriages of clergymen became a sure object of invective. Their wives received the appellation of *concubines* or some other more opprobrious name. The secular clergy, on the other hand, who were numerous and rich, defended themselves with vigour, and endeavoured to retaliate upon their adversaries. The people were thrown into the most violent ferments; but the monks, being patronised by King Edred, gained ground greatly upon their opponents. Their progress, however, was somewhat retarded by the king's death, which happened in 955, after a reign of nine years. He left children; but as they were infants, his nephew Edwy, son to Edmund, was placed on the throne.

⁵⁶
Subdues the Northumbrians.

⁵⁷
Celibacy of the clergy introduced.

⁵⁸
Edwy. The new king was not above 16 or 17 years of age at the time of his accession. His reign is only remarkable for the tragical story of his queen Elgiva. She was a princess of the royal blood, with whom Edwy was deeply enamoured. She was his second or third cousin, and therefore within the degrees of affinity prohibited by the canon law. Edwy, however, hearkening only to the dictates of his passion, married her, contrary to the advice of the more dignified ecclesiastics. The monks on this occasion were particularly violent; and therefore Edwy determined not to second their ambitious projects. He soon found reason to repent his having provoked such dangerous enemies. On his coronation day, while his nobility were indulging them-

elves in riotous mirth in a great hall where they had assembled, Edwy withdrew to another apartment to enjoy the company of his beloved queen and her mother. Dunstan guessed the reason of his absence. With unparalleled impudence, he burst into the queen's apartment; and upbraiding Edwy with his lasciviousness, as he termed it, pushed him back to the hall where the nobles were assembled. The king determined to resent such a daring insult. He required from Dunstan an account of his administration of the treasury during the late reign. The monk, probably unable to give a just account, refused to give any; upon which Edwy accused him of malversation in his office, and banished him the kingdom.

^{England.}

This proved the worst step that could possibly have been taken. Dunstan was no sooner gone than the whole nation was in an uproar about his sanctity and the king's impiety. These clamours, as they had been begun by the clergy, so they were kept up and increased by them, till at last they proceeded to the most outrageous violence. Archbishop Odo sent a party of soldiers to the palace. They seized the queen, and burned her face with a red-hot iron, in order to destroy her beauty by which she had enticed her husband; after which they carried her by force into Ireland, there to remain in perpetual exile. The king, finding it in vain to resist, was obliged to consent to a divorce from her, which was pronounced by Archbishop Odo. A catastrophe still more dismal awaited Elgiva. She had been cured of her wounds, and had even found means to efface the scars with which her persecutors had hoped to destroy her beauty. She then came to England, with a design to return to the king, whom she still considered as her husband. Unfortunately, however, she was intercepted by a party of soldiers sent for that purpose by the primate. Nothing but her most cruel death could now satisfy that wretch and his accomplices. She was hamstrung at Gloucester, and expired in a few days.

⁵⁹
Tragical death of the queen.

The minds of the English were at this time so much sunk in superstition, that the monstrous inhumanity above mentioned was called a judgment from God upon Edwy and his spouse for their dissolute life, i. e. their love to each other. They even proceeded to rebellion against their sovereign; and having raised to the throne Edgar, the younger brother of Edwy, at that time only 13 years of age, they soon put him in possession of Mercia, Northumberland, and East Anglia. Edwy being thus confined to the southern counties, Dunstan returned, and took upon him the government of Edgar and his party; but the death of Edwy soon removed all difficulties, and gave Edgar peaceable possession of the government.

The reign of Edgar proved one of the most fortunate mentioned in the ancient English history. He took the most effectual methods both for preventing tumults at home and invasions from abroad. He quartered a body of disciplined troops in the north, in order to repel the incursions of the Scots, and to keep the Northumbrians in awe. He built a powerful navy; and that he might keep the seamen in the practice of their duty, as well as present a formidable armament to his enemies, he commanded the fleet from time to time to make the circuit of his dominions.

⁶⁰

England.

The greatness of King Edgar, which is very much celebrated by the English historians, was owing to the harmony which reigned between him and his subjects; and the reason of this good agreement was, that the king sided with Dunstan and the monks, who had acquired a great ascendant over the people. He enabled them to accomplish their favourite scheme of dispossessing the secular canons of all the monasteries; and he consulted them not only in ecclesiastical but also in civil affairs. On these accounts, he is celebrated by the monkish writers with the highest praises; though it is plain, from some of his actions, that he was a man who could be bound neither by the ties of religion nor humanity. He broke into a convent, and carried off by force, and ravished, a nun called *Editha*. His spiritual instructor, Dunstan, for this offence, obliged the king, not to separate from his mistress, but to abstain from wearing his crown for seven years!

61
His licentious amours.

Edgar, however, was not to be satisfied with one mistress. He happened once to lodge at the house of a nobleman who had a very beautiful daughter. Edgar inflamed with desire at the sight of the young lady, without ceremony asked her mother to allow her to pass a night with him. She promised compliance; but secretly ordered a waiting-maid, named *Elfreda*, to steal into the king's bed when the company were gone, and to retire before day-break. Edgar, however, detained her by force, till day-light discovered the deceit. His love was now transferred to the waiting-maid; who became his favourite mistress, and maintained a great ascendant over him till his marriage with *Elfrida*.

62
His marriage with *Elfrida*.

The circumstances of this marriage were still more singular and criminal than those above mentioned. *Elfrida* was daughter and heiress to *Olgar* earl of Devonshire. She was a person of such exquisite beauty, that her fame was spread all over England, though she had never been at court. Edgar's curiosity was excited by the accounts he had heard of her, and therefore formed a design of marrying her. He communicated his intention to *Earl Athelwold* his favourite; and ordered him, on some pretence or other, to visit the earl of Devonshire, and bring him a certain account concerning *Elfrida*. *Athelwold* went as he was desired; but fell so deeply in love with the lady himself, that he resolved to sacrifice his fidelity to his passion. He returned to Edgar, and told him, that *Elfrida's* charms were by no means extraordinary, and would have been totally overlooked in a woman of inferior station. After some time, however, turning the conversation again upon *Elfrida*, he told the king that he thought her parentage and fortune made her a very advantageous match; and therefore, if the king gave his consent, he would make proposals to the earl of Devonshire on his own behalf. Edgar consented, and *Athelwold* was married to *Elfrida*.—After his marriage, he used his utmost endeavours to keep his wife from court, that Edgar might have no opportunity of observing her beauty. The king, however, was soon informed of the truth; and told *Athelwold*, that he intended to pay him a visit in his castle, and be made acquainted with his new-married wife. The earl could make no objections; only he desired a few hours to prepare for the visit. He then confessed the whole

to *Elfrida*, and begged of her to appear before the king as much to the disadvantage as possible. Instead of this, she dressed herself to the greatest advantage. Edgar immediately conceived a violent passion for her; and, in order to gratify it, seduced *Athelwold* into a wood under pretence of hunting, where he stabbed him with his own hand, and afterwards married his widow.

England.

The reign of Edgar is remarkable among historians for the encouragement he gave to foreigners to reside at his court and throughout the kingdom. These foreigners, it is said, corrupted the former simple manners of the nation. Of this simplicity, however, there seems to be no great reason to boast; seeing it could not preserve them from treachery and cruelty, the greatest of all vices: so that their acquaintance with foreigners was certainly an advantage to the people, as it tended to enlarge their views, and cure them of those illiberal prejudices and rustic manners to which islanders are often subject.—Another remarkable incident, is the extirpation of wolves from England. The king took great pleasure in hunting and destroying these animals himself. At last he found that they had all taken shelter in the mountains and forests of Wales. Upon this he changed the tribute imposed upon the Welsh princes by *Athelstan*, into an annual tribute of 300 wolves heads; and thus produced such diligence in hunting them, that the animal has never since appeared in England.

63
Wolves extirpated from England.

Edgar died in 957, after a reign of 16 years. He left a son named *Edward*, whom he had by his first wife the daughter of *Earl Ordmer*; and another, named *Ethelred*, by *Elfrida*. The mental qualifications of this lady were by no means answerable to the beauty of her person. She was ambitious, haughty, treacherous, and cruel. The principal nobility, therefore, were greatly averse from the succession of her son *Ethelred*, which would unavoidably throw too much power into the hands of his mother, as he himself was only seven years of age. *Edward*, afterwards surnamed the *Martyr*, was therefore pitched upon: and was certainly the most proper person, as he was 15 years of age, and might soon be able to take the government into his own hands. *Elfrida* opposed his advancement with all her might: but *Dunstan* overcame every obstacle, by anointing and crowning the young prince at *Kingston*; upon which the whole kingdom submitted without farther opposition.

64
Edward the martyr.

The only remarkable occurrence in this reign was the complete victory gained by the monks over the secular clergy, who were now totally expelled from the convents. Though this had been pretty nearly accomplished by Edgar, the secular clergy still had partisans in England who made considerable opposition: but these were all silenced by the following miracles. In one synod, *Dunstan*, finding the majority of votes against him, rose up, and declared that he had that instant received from heaven a revelation in favour of the monks. The whole assembly was so much overawed by this intelligence, that they proceeded no farther in their deliberations. In another synod, a voice issued from the crucifix, acquainting the members, that the establishment of the monks was founded on the will of heaven, and could not be opposed without impiety. But the third miracle was still more alarming. In another

65
Miracles of St Dunstan.

other

England. other synod the floor of the hall sunk, and great numbers of the members were killed or bruised by their fall. It was remarked that Dunstan had that day prevented the king from attending the synod, and that the beam on which his own chair stood was the only one which did not sink. These circumstances, instead of making him suspected as the author of the miracle, were regarded as proofs of the interposition of Providence in his favour.

Edward lived four years after he was raised to the throne, in perfect innocence and simplicity. Being incapable of any treacherous intention himself, he suspected none in others. Though his stepmother had opposed his succession, he had always behaved towards her with the greatest respect; and expressed on all occasions the most tender affection for his brother Ethelred. Being one day hunting in the neighbourhood of the castle where Elfrida resided, he paid her a visit unattended by any of his retinue. After mounting his horse with a design to return, he desired some liquor to be brought him. But while he was holding the cup to his head, a servant of Elfrida stabbed him behind. The king, finding himself wounded, clapped spurs to his horse; but soon becoming faint by the loss of blood, he fell from the saddle, and his foot being entangled in the stirrup, he was dragged along till he expired. His body was found and privately interred at Wereham by his servants. The English had such compassion for this amiable prince, that they bestowed on him the appellation of *Martyr*, and even fancied that miracles were wrought at many penances, in order to atone for her guilt; but, even in that barbarous age, she could never regain the good opinion of the public.

66
The king
murdered.

67
Ethelred.

After the murder of Edward, his brother Ethelred succeeded to the throne without opposition. As he was a minor when he was raised to the throne, and, even when he came to man's estate, never discovered any vigour or capacity of defending the kingdom against invaders, the Danes began to renew their incursions. Before they durst attempt any thing of importance, however, they first made a small incursion by way of trial. In the year 981, they landed in Southampton from seven vessels; and having ravaged the country, they retired with impunity, carrying a great booty along with them. In 987, they made a similar attempt on the west coast, and were attended with the like success. Finding that matters were now in a favourable situation for their enterprises, they landed in Essex under the command of two chieftains; and, having defeated and killed Brithnot duke of that county, laid waste all the neighbouring provinces. In this extremity, Ethelred, surnamed, on account of his preposterous conduct, the *Unready*, bribed the enemy with 10,000*l.* to depart the kingdom. This advice was given by Siricius archbishop of Canterbury, and some of the degenerate nobility; and was attended with the success that might have been expected. The Danes appeared next year off the eastern coast. But, in the mean time, the English had determined to assemble at London a fleet capable of repulsing the enemy. This failed of success through the treachery of Alfric duke of Mercia. Having been formerly banished the kingdom, and found great difficulty in getting himself restored to his former dignity, he trusted thenceforth,

68
England
invaded and
ruined by
the Danes.

not to his services or the affections of his countrymen, but to the influence he had over his vassals, and to the public calamities. These last he determined always to promote as far as he could: because in every revolution his assistance would be necessary, and consequently he must receive a continual accession of power. The English had formed a plan for surrounding and destroying the Danish fleet in the harbour; but Alfric not only gave the enemy notice of this design, but also deserted with his squadron the night before the engagement. The English by this means proved unsuccessful; and Ethelred, in revenge, took Alfgar, Alfric's son, and ordered his eyes to be put out. This piece of cruelty could be productive of no good effect. Alfric had become so powerful, that, notwithstanding his treachery, it was found impossible to deprive him of the government of Mercia.

England.

In 993, the Danes under the command of Sweyn their king, and the Norwegians conducted by Olave king of that country, sailed up the Humber, and destroyed all around them. A powerful army was assembled to oppose these invaders; but through the treachery of the three leaders, all men of Danish extraction, the English were totally defeated. Encouraged by this success, the Danes entered the Thames in 94 vessels, and laid siege to London. The inhabitants, however, made such a brave defence, that the besiegers were finally obliged to give over the attempt. Out of revenge for this disappointment, they laid waste Essex, Sussex, and Hampshire. In these counties they procured horses; by which means they were enabled to penetrate into the more inland parts, and threatened the kingdom with total subjection. Ethelred and his nobles had now recourse to their former expedient. They sent ambassadors to the two northern kings, to whom they promised subsistence and tribute, provided they would, for the present, put an end to their ravages, and soon after depart the kingdom. They agreed to the terms, and peaceably took up their quarters at Southampton. Olave even paid a visit to Ethelred, and received the rite of confirmation from the English bishops. The king also made him many presents; and Olave promised never more to infest the English territories; which promise it is said he afterwards religiously observed.

After the departure of Olave with his Norwegians, Sweyn, though less scrupulous than the king of Norway, was obliged to leave the kingdom also. But this shameful composition procured only a short relief to the nation. The Danes soon after appeared in the Severn; and having ravaged Wales as well as Cornwall and Devon, they sailed round, and, entering the mouth of the Tamar, completed the ruin of these two counties. Then, returning to the Bristol channel, and penetrating into the country by the Avon, they overran all that country, and carried fire and sword even into Dorsetshire. In 998, they changed the feat of war; and, after ravaging the isle of Wight, they entered the Thames and Medway, where they laid siege to Rochester and defeated the Kentish men in a great battle. After this victory, the whole province of Kent was made a scene of slaughter and devastation. The extremity of these miseries forced the English into councils for common defence both by sea and land: but the weakness of the king, the divisions among the nobility, the treachery of some, the cowardice of others,

the

England. the want of concert in all, frustrated every endeavour; and their fleets and armies either came too late to attack the enemy, or were repulsed with dishonour. The English, therefore, devoid both of prudence and unanimity in council, had recourse to the expedient which by experience they had found to be ineffectual. They offered the Danes a large sum if they would conclude a peace and depart the kingdom. These ravagers continually rose in their demands; and now required the payment of 24,000*l.* which the English submitted to give. The departure of the Danes procured them a temporary relief; which they enjoyed as if it was to be perpetual, without making any effectual preparations for giving them a more vigorous reception upon their next return.

69
Marriage
of the king
with the
princess of
Normandy.

Besides the receiving this sum, the Danes were at present engaged by another motive to depart from England. They were invited over by their countrymen in Normandy, who at this time were hard pressed by Robert king of France, and who found it difficult to defend their settlements against him. It is probable also, that Ethelred, observing the close connection of all the Danes with one another, however they might be divided in government or situation, was desirous of procuring an alliance with that formidable people. For this purpose, being at present a widower, he made his addresses to Emma, sister to Richard II. duke of Normandy. He soon succeeded in his negotiations; the princess came over to England, and was married to the king in the year 1001.

Though the Danes had been for a long time established in England, and though the similarity of their language with the Saxon had invited them to an early coalition with the natives; they had as yet found so little example of civilized manners among the English, that they retained all their ancient ferocity, and valued themselves only on their national character of military bravery. The English princes had been so well acquainted with their superiority in this respect, that Athelstan and Edgar had been accustomed to keep in pay large bodies of Danish troops, who were quartered about the country, and committed many violences upon the inhabitants. These mercenaries had attained to such a height in luxury, according to the old English writers, that they combed their hair once a-day, bathed themselves once a-week, changed their clothes frequently; and by all these arts of effeminacy, as well as by their military character, had rendered themselves so agreeable to the fair sex, that they debauched the wives and daughters of the English, and had dishonoured many families. But what most provoked the inhabitants was, that, instead of defending them against invaders, they were always ready to betray

them to the foreign Danes, and to associate themselves with every straggling party which came from that nation. England.

The animosities between the native English and the Danes who inhabited among them, had from these causes risen to a great height; when Ethelred, from a policy commonly adopted by weak princes, took the cruel resolution of massacring the Danes throughout the kingdom. On the 13th of November 1002, secret orders were dispatched to commence the execution everywhere on the same day; and the festival of St Brice, which fell on a Sunday, the day on which the Danes usually bathed themselves, was chosen for this purpose. These cruel orders were executed with the utmost exactness. No distinction was made betwixt the innocent and the guilty; neither sex nor age was spared; nor were the cruel executioners satisfied without the tortures, as well as death, of the unhappy victims. Even Gunilda, sister to the king of Denmark, who had married Earl Paling, and had embraced Christianity, was, by the advice of Edric earl of Wilts, seized and condemned to death by Ethelred, after seeing her husband and children butchered before her face. This unhappy princess foretold, in the agonies of despair, that her murder would soon be avenged by the total ruin of the English nation (A).

70
Danes mas-
sacred.

The prophecy of Gunilda was exactly fulfilled. In 1003, Sweyn and his Danes, who wanted only a pretence to renew their invasions, appeared off the western coast, and threatened revenge for the slaughter of their countrymen. The English took measures for repulsing the enemy; but these were defeated through the treachery first of Alfric, and then of Edric, a still greater traitor, who had married the king's daughter, and succeeded Alfric in the command of the British armies. The Danes therefore ravaged the whole country. Agriculture was neglected, a famine ensued, and the kingdom was reduced to the utmost degree of misery. At last the infamous expedient of buying a peace was resorted to; and the departure of the Danes was purchased, in 1007, at the expence of 30,000*l.*

71
New inva-
sion by
Sweyn.

The English endeavoured to employ this interval in making preparations against the return of the Danes, which they had reason soon to expect. A law was made, ordering the proprietors of eight hides of land to provide themselves of a horseman and a complete suit of armour; and those of 310 hides to equip a ship for the defence of the kingdom. By this means a formidable armament was raised. There were 243,600 hides in England; consequently the ships equipped must be 785. The cavalry was 30,450 men. All hopes of success from this equipment, however, were disappointed by the factions, animosities, and dissensions

(A) On the subject of this massacre, Mr Hume has the following observations: "Almost all the ancient historians speak of this massacre of the Danes as if it had been universal, and as if every individual of that nation throughout England had been put to death. But the Danes were almost the sole inhabitants in the kingdoms of Northumberland and East Anglia, and were very numerous in Mercia. This representation of the matter was absolutely impossible. Great resistance must have been made, and violent wars ensued: which was not the case. This account given by Wallingford, though he stands single, must be admitted as the only true one. We are told that the name of *lurdane*, *lord Dane*, for an idle lazy fellow who lives at other people's expence, came from the conduct of the Danes who were put to death. But the English princes had been entirely masters for several generations; and only supported a military corps of that nation. It seems probable, therefore, that these Danes only were put to death."

England. tions of the nobility. Edric had caused his brother
 Brightic to advance an accusation of treason against
 Wolfnoth governor of Suffex, the father of the famous
 Earl Godwin; and that nobleman, knowing the power
 and malice of his enemy, consulted his own safety by
 deserting with 20 ships to the Danes. Brightic pur-
 sued him with a fleet of 80 sail; but his ships being
 shattered in a tempest, and stranded on the coast, he
 was suddenly attacked by Wolfnoth, and all his vessels
 were burnt or otherwise destroyed. The treachery of
 Edric frustrated every plan of future defence; and the
 whole navy was at last scattered into the several harbours.

By these fatal miscarriages, the enemy had leisure
 to overrun the whole kingdom. They had now got
 such a footing, indeed, that they could hardly have
 been expelled though the nation had been ever so un-
 animous. But so far did mutual diffidence and dissen-
 sion prevail, that the governors of one province refu-
 sed to march to the assistance of another; and were at
 last terrified from assembling their forces for the defence
 of their own. At last the usual expedient was tried.
 A peace was bought with 48,000l.; but this did not
 procure even the usual temporary relief. The Danes,
 knowing that they were now masters of the kingdom,
 took the money, and continued their devastations.
 They levied a new contribution of 8000l. on the
 county of Kent alone; murdered the archbishop of
 Canterbury, who had refused to countenance this exac-
 tion; and the English nobility submitted everywhere
 to the Danish monarch, swearing allegiance to him, and
 giving hostages for their good behaviour. At last, E-
 thelred himself, dreading equally the violence of the
 enemy and the treachery of his own subjects, fled into
 Normandy, whither he had already sent Queen Emma
 and her two sons Alfred and Edward. The duke re-
 ceived his unhappy guests with a generosity which does
 honour to his memory.

The flight of King Ethelred happened in the end of
 the year 1013. He had not been above six weeks in
 Normandy, when he heard of the death of Sweyn,
 which happened at Gainborough before he had time
 to establish himself in his new dominions. At the same
 time he received an invitation from the prelates and
 nobility to resume the kingdom; expressing also their
 hopes, that, being now better taught by experience,
 he would avoid those errors which had been so fatal to
 himself and his people. But the misconduct of Ethel-
 red was incurable; and, on his resuming the govern-
 ment, he behaved in the very same manner that he had
 done before. His son-in-law Edric, notwithstanding
 his repeated treasons, retained such influence at court,
 that he instilled into the king jealousies of Sigefert and
 Morcar, two of the chief nobles of Mercia. Edric en-
 ticed them into his house, where he murdered them;
 while Ethelred partook of the infamy of this action,
 by confiscating their estates, and confining the widow of
 Sigefert in a convent. She was a woman of singular
 beauty and merit; and in a visit which was paid her,
 during her confinement, by Prince Edmund the king's
 eldest son, she inspired him with so violent an affection,
 that he released her from the convent, and soon after
 married her without his father's consent.

In the mean time, Canute, the son and successor of
 Sweyn, proved an enemy no less terrible to the English

than his father had been. He ravaged the eastern coast
 with merciless fury; and put ashore all the English
 hostages at Sandwich, after having cut off their hands
 and noses. He was at last obliged, by the necessity of
 his affairs, to return to Denmark. In a short time,
 however, he returned, and continued his depredations
 along the southern coast. He then broke into the
 counties of Dorset, Wilts, and Somerset; where an
 army was assembled against him under the command of
 Prince Edmund and Duke Edric. The latter still con-
 tinued his perfidious machinations; and after endea-
 vouring in vain to get the prince into his power, found
 means to dissipate the army, and then deserted to Ca-
 nute with 40 vessels.

Edmund was not disheartened by this treachery. He
 again assembled his forces, and was in a condition to
 give the enemy battle. Ethelred, however, had now
 such frequent experience of the treachery of his sub-
 jects, that he had lost all confidence in them. He re-
 mained in London, pretending sickness, but in reality
 from an apprehension that they intended to buy their
 peace by delivering him into the hands of his enemies.
 The army called aloud for their sovereign to march at
 their head against the Danes; and on his refusal to
 take the field, they were so discouraged, that all the
 preparations which had been made became ineffectual
 for the defence of the kingdom. Edmund, deprived
 of all regular resources for the maintenance of the sol-
 diers, was obliged to commit similar ravages to those
 practised by the Danes; and after making some fruit-
 less expeditions into the north, which had submitted
 entirely to Canute's power, he returned to London,
 where he found every thing in confusion by the death
 of the king.

Ethelred died in 1016, after an unhappy reign of ⁷⁴
 35 years; and was succeeded by his eldest son Ed-
 mund, surnamed *Ironside* on account of his great strength
 and valour. He possessed abilities sufficient to have <sup>Ironside di-
 vides the
 kingdom
 with the
 Danes.</sup>
 saved his country from ruin, had he come sooner to
 the throne; but it was now too late. He bravely op-
 posed the Danes, however, notwithstanding every dis-
 advantage; till at last the nobility of both nations ob-
 liged their kings to come to a compromise, and divide
 the kingdom between them by treaty. Canute re-
 served to himself Mercia, East Anglia, and Northum-
 berland, which he had entirely subdued. The southern
 parts were left to Edmund. This prince survived the
 treaty only about a month; being murdered at Oxford
 by two of his chamberlains, accomplices of Edric.

After the death of Edmund, nothing was left for ⁷⁵
 the English but submission to Canute. The least scru-
 pulous of mankind, however, dare not at all times
 openly commit injustice. Canute therefore, before he
 seized the dominions of Edwin and Edward, the two
 sons of Edmund, suborned some of the nobility to de-
 pose, that, in the last treaty with Edmund, it had
 been verbally agreed, that, in case of Edmund's death,
 Canute should either be successor to his dominions, or
 tutor to his children; for historians differ with regard
 to this particular. This evidence, supported by the
 great power of Canute, was sufficient to get him elect-
 ed king of England. Immediately after his accession
 to the throne, he sent the two sons of Edmund to the
 court of Sweden, on pretence of being there educated;
 but

⁷²
 Ethelred
 flies to Nor-
 mandy.

⁷³
 Returns,
 but behaves
 as ill as
 ever.

England. but charged the king to put them to death as soon as they arrived. The Swedish monarch did not comply with this request; but sent them to Solomon king of Hungary, to be educated in his court. The elder, Edwin, was afterwards married to Solomon's sister: but he dying without issue, that prince gave his sister-in-law, Agatha, daughter of the emperor Henry II. in marriage to Edward, the younger brother; and she bore him Edgar Atheling; Margaret, afterwards queen of Scotland; and Christina, who retired into a convent.

76
Marries
Ethelred's
widow.

Canute was obliged at first to make great concessions to the nobility: but he afterwards put to death many of those in whom he could not put confidence; and, among the rest, the traitor Edric himself, who was publicly executed, and his body thrown into the Thames. In order to prevent any danger from the Normans, who had threatened him with an invasion, he married Emma the widow of Ethelred, and who now came over from Normandy; promising that he would leave the children he should have by that marriage heirs to the crown after his decease. The English were at first displeas'd with Emma for marrying the mortal enemy of her former husband; but at the same time were glad to find at court a sovereign to whom they were accustomed, and who had already formed connections with them: and thus Canute, besides securing by his marriage the alliance with Normandy, gradually acquired by the same means the confidence of his own people.

The most remarkable transaction in this prince's reign, besides those mentioned under the article CANUTE, is his expedition to Scotland against Malcolm king of that country, whom he forced to do homage for the county of Cumberland, which the Scots at that time possessed. After this enterprize, Canute pass'd four years in peace, and died at Shaftsbury; leaving three sons, Sweyn, Harold, and Hardicanute. Sweyn, whom he had by his first marriage with Alfvén, daughter of the earl of Hampshire, was crowned in Norway; Hardicanute, whom Emma had born, was in possession of Denmark; and Harold, who was of the same marriage with Sweyn, was at that time in England.

77
Harold.

Harold succeeded to the crown of England; though it had been stipulated that Emma's son, Hardicanute, should be heir to that kingdom. This advantage Harold obtained by being on the spot, and getting possession of his father's treasures, while Hardicanute was at a distance. As Hardicanute, however, was supported by Earl Godwin, a civil war was likely to ensue, when a compromise was made; by which it was agreed, that Harold should enjoy London, and all the provinces north of the Thames, while the possession of the south should remain to Hardicanute: and till that prince should appear and take possession of his dominions, Emma fix'd her residence at Winchester, and ruled her son's part. Harold reigned four years; during which time, the only memorable action he performed was a most infamous piece of treachery.—Alfred and Edward, the two sons of Emma by Ethelred, paid a visit to their mother in England. But, in the mean time, Earl Godwin being gain'd over by Harold, a plan was laid for the destruction of the two princes. Alfred was accordingly invited to London by Harold,

78
His treach-
ery and
cruelty.

with many professions of friendship; but when he had reached Guildford, he was set upon by Godwin's vassals: about 600 of his train were murdered in the most cruel manner; he himself was taken prisoner, his eyes were put out, and he was conducted to the monastery of Ely, where he died soon after. Edward and Emma, apprised of the fate which awaited them, fled beyond sea, the former into Normandy, the latter into Flanders; while Harold took possession of all his brother's dominions without opposition.—He died in April 1039.

Hardicanute succeeded his brother Harold without opposition. His government was extremely violent and tyrannical. However, it was but of short duration. He died, in 1041, of a debauch at the marriage of a Danish lord. After his death, a favourable opportunity was offer'd to the English for shaking off the Danish yoke. Sweyn, king of Norway, the eldest son of Canute, was absent; and as the two last kings had died without issue, there appear'd none of that race whom the Danes could support as successor to the throne. For this reason, the eyes of the nation were naturally drawn towards Prince Edward, who happened to be at court when the king died. There were some reasons, however, to fear, that Edward's succession would be oppos'd by Earl Godwin, who was by far the most powerful nobleman in the kingdom. A declared animosity subsisted between Edward and Godwin, on account of the hand which the latter had in the murder of his brother Alfred; and this was thought to be an offence of so grievous a nature, that Edward could never forgive it. But here their common friends interpos'd; and representing the necessity of their good correspondence, oblig'd them to lay aside their animosities, and to concur in restoring liberty to their native country. Godwin only stipulated, that Edward, as a pledge of his sincere reconciliation, should promise to marry his daughter Editha. This proposal was agreed to; Edward was crowned king of England, and married Editha as he had promis'd. The marriage, however, proved rather a source of discord than otherwise between the king and Godwin. Editha, though a very amiable woman, could never obtain the confidence and affection of her husband. It is even said that during the whole course of her life he abstain'd from all matrimonial converse with her; and this ridiculous behaviour was highly celebrated by the monkish writers of the age, and contributed to the king's acquiring the title of Saint and Confessor.

79
Edward the
Confessor.

Though the neglect of his daughter could not fail to awaken Godwin's former enmity against King Edward, it was necessary to choose a more popular ground before he could vent his complaints against the king in a public manner. He therefore chose for his theme the influence which the Normans had on the affairs of the government; and declared opposition took place between him and these favourites. In a short time, this animosity openly broke out with great violence. Eustace count of Boulogne having paid a visit to the king, pass'd by Dover on his return. One of his train being refus'd access to a lodging which had been appointed for him, attempted to make his way by force, and wounded the master of the house in the contest. The townsmen revenged this insult by the death of the stranger; the count and his train took arms, and murdered

80
Variance of
the king
and earl
Godwin.

England. murdered the townsman in his own house. A tumult ensued; near 20 persons were killed on each side; and Eustace being overpowered with numbers, was at last obliged to fly. He complained to the king; who gave orders to Earl Godwin, in whose government Dover lay, to punish the inhabitants. But this nobleman refused to obey the command, and endeavoured to throw the whole blame on Count Eustace and his followers. The king was displeas'd; and threatened to make him feel the utmost effects of his resentment, in case he finally refused to comply. Upon this, Godwin assembled a powerful army, on pretence of repressing some disorders on the frontiers of Wales; but, instead of this, marched directly to Gloucester, where the king at that time was without any military force, as suspecting no danger.

Edward, perceiving his danger, applied to Siward duke of Northumberland, and Leofric duke of Mercia, two very powerful noblemen. They hastened to him with such followers as they could assemble, issuing orders at the same time for all the forces under their respective governments to march without delay to the defence of the king. Godwin, in the mean time, suffered himself to be deceived by negotiations, till the king's army became so powerful, that he was not able to cope with it. He was therefore obliged to fly with his family to Flanders. Here he was protected by Baldwin earl of that country, together with his three sons, Gurth, Sweyn, and Tosti; the last of whom had married Baldwin's daughter. Harold and Leofwin, two other sons of Godwin, took shelter in Ireland.

After the flight of Earl Godwin, he was proceeded against as a traitor by King Edward. His estates, and those of his sons, were confiscated; his governments given to others; Queen Editha was confined in a monastery; and the great power of this family, which had become formidable to the crown itself, seem'd to be totally overthrown. Godwin, however, soon found means to retrieve his affairs. Having hired some ships, and manned them with his followers, he attempted to make a descent at Sandwich. The king, informed of his preparations, equipped a fleet which Godwin could not resist, and he therefore retreated into the Flemish harbours. On his departure, the English dismissed their armament. This Godwin had expected, and therefore kept himself in readiness for the favourable opportunity. He immediately put to sea, and sail'd to the isle of Wight, where he was joined by Harold with a squadron which he had collected in Ireland. Being thus master of the sea, Godwin entered the harbours on the southern coast; seized all the ships; and being joined by great numbers of his former vassals, he sail'd up the Thames, and appear'd before London.

The approach of such a formidable enemy threw every thing into confusion. The king alone seem'd resolute to defend himself to the last extremity; but the interposition of many of the nobility, together with the submissions of Godwin himself, at last produced an accommodation. It was stipulated, that Godwin should give hostages for his good behaviour, and that all the foreigners should be banished the kingdom; after which, Edward, sensible that he had not power sufficient to detain the earl's hostages in England, sent

VOL. VIII. Part I.

them over to his kinsman the young duke of Normandy. England.

Soon after this reconciliation, Godwin died as he was sitting at table with the king. He was succeeded in the government of Wesssex, Suffex, Kent, and Effex, and the office of steward of the household, a place of great power, by his son Harold. The son was no less ambitious than his father had been; and as he was a man of much greater abilities, he became a more dangerous enemy to Edward than even Godwin had been. Edward knew no better expedient to prevent the increase of Harold's power, than by giving him a rival. This was Algar son of Leofric duke of Mercia, whom he invest'd with the government of East Anglia, which had formerly belonged to Harold. The latter however, after some broils, finally got the better of his rival, and banished him the kingdom. Algar returned soon after with an army of Norwegians, with whom he invaded East Anglia; but his death in a short time freed Harold from all further apprehensions from that quarter. His power was still further increased in a short time after by the accession of his brother Tosti to the government of Northumberland; and Edward now declining in years, and apprehensive that Harold would attempt to usurp the crown after his death, resolv'd to appoint a successor. He therefore sent a deputation into Hungary, to invite over his nephew, Edward, son to his elder brother, who was the only remaining heir of the Saxon line. That prince accordingly came over with his children, Edgar Atheling, Margaret, and Christina; but died a few days after his arrival. His death threw the king into greater perplexity than ever. Being resolv'd to exclude Harold if possible, he secretly cast his eye on his kinsman William duke of Normandy; a person of whose power, character, and capacity, he had justly a very high opinion. This advice had formerly been given him by Robert archbishop of Canterbury, who was himself a Norman, and had been banished along with the rest upon the return of Earl Godwin. But Edward finding that the English would more easily acquiesce in the restoration of the Saxon line, had in the mean time invited his brother's descendants from Hungary, as already mentioned. The death of his nephew, and the inexperience and unpromising qualities of young Edgar, made him resume his former intentions in favour of the duke of Normandy, though his aversion to hazardous enterprizes engag'd him to postpone the execution, and even to keep his purpose concealed from all his ministers.

Harold in the mean time increased his popularity by all possible means, in order to prepare his way for being advanced to the throne after the death of Edward, which now seem'd to be fast approaching. He had no suspicion of the duke of Normandy as a rival; but as he knew that a son and grandson of the Earl Godwin were in the hands of that prince as hostages, he fear'd that they might be made use of as checks upon his ambition, in case he attempted afterwards to ascend the throne. He therefore prevail'd upon Edward to release these hostages unconditionally; and having obtained his consent, he set out for Normandy himself, attend'd by a numerous retinue. He was driven by a tempest on the territory of Guy count of Ponthieu,

England.

Ponthieu, who detained him prisoner, and demanded an exorbitant sum for his ransom. Harold found means to acquaint William with his situation. The duke of Normandy, desirous of gaining Harold over to his party, commanded Guy to restore his prisoner to his liberty. Upon this Harold was immediately put into the hands of the Norman ambassador, who conducted him to Rouen. William received him with great demonstrations of respect and friendship; but soon took an opportunity of acquainting him with his pretensions to the crown of England, and asked his assistance in the execution of his scheme. Harold was surpris'd with this declaration of the duke; but being entirely in his power, he feign'd a compliance with his desires, and promised to second to the utmost of his ability the will of King Edward. William, to secure him as much as possible to his interest, promised him his daughter in marriage, and required him to take an oath that he would fulfil his promises. Harold readily complied; but to make the oath more binding, William privately convey'd under the altar where the oath was taken relics of some of the most revered martyrs; and when Harold had taken the oath, he showed him the relics, and admonish'd him to observe religiously such a solemn engagement.

Harold was no sooner set at liberty, than he found himself master of casuistry sufficient to excuse the breaking of his oath, which had been extorted from him, and which, if kept, might be attended with the subjection of his country to a foreign power. He continued to practise every art to increase his popularity; and about this time, two accidents enabled him to add much to that character which he had already so well established. The Welsh had for some time made incursions into the English territories, and had lately become so troublesome, that Harold thought he could not do a more acceptable piece of service to the public, than undertake an expedition against these invaders. Having therefore prepared some light-armed foot to pursue the natives into their fortresses, some cavalry to secure the open country, and a squadron of ships to attack the sea-coasts, he employ'd all these forces against the enemy at once; and thus reduced them to such distress, that they were oblig'd to purchase peace by sending their prince's head to Harold, and submitting to the government of two Welsh noblemen appointed by Edward.

The other incident was no less honourable to Harold. Tosti his brother had been created duke of Northumberland; but being of a violent tyrannical temper, had treated the inhabitants with such cruelty, that they rose in rebellion against him, and drove him from his government. Morcar and Edwin, two brothers, grandsons of the great Duke Leofric, join'd in the insurrection; and the former being elected duke, advanced with an army to oppose Harold, who had been commission'd by the king to reduce and punish the Northumbrians. Before the armies engag'd, Morcar endeavour'd to justify his conduct, and represent'd to Harold, that Tosti had behaved in such a manner, that no one, not even a brother, could defend him without participating of the infamy of his conduct: that the Northumbrians were willing to submit to the king, but required a governor that would pay some attention to their privileges; and they trust-

England.

ed that Harold would not defend in another that violent conduct from which his own government had always kept at so great a distance. This speech was accompanied by such a detail of well supported facts, that Harold abandoned his brother's cause; and returning to Edward, persuad'd him to pardon the Northumbrians, and confirm Morcar in his government. He even marry'd the sister of that nobleman; and by his interest procur'd Edwin the younger brother to be chosen governor of Mercia. Tosti, in a rage, departed the kingdom, and took shelter in Flanders with Baldwin his father-in-law; while William of Normandy saw that now he had nothing to expect from Harold, who plainly intended to secure the crown for himself.

Edward died in 1067, and was succeeded by Harold with as little opposition as though he had been the lawful heir. The very day after Edward's death, he was anointed and crown'd by the archbishop of York. The whole nation seem'd joyfully to swear allegiance to him. But he did not long enjoy the crown, to obtain which he had taken so much pains, and which he seem'd to have such capacity for wearing. His brother Tosti, provok'd at his success, stirr'd up against him every enemy he could have any influence with. The duke of Normandy also was enrag'd to the last degree at the perfidy of Harold; but before he commenc'd hostilities, he sent an embassy to England, upbraiding the king with his breach of faith, and summoning him to resign the kingdom immediately. Harold replied, that the oath, with which he was reproach'd, had been extorted by the well grounded fear of violence, and for that reason could never be regard'd as obligatory: that he never had any commission either from the late king or the states of England, who alone could dispose of the crown, to make any tender of the succession to the duke of Normandy; and if he, a private person, had assum'd so much authority, and had even voluntarily sworn to support the duke's pretensions, the oath was unlawful, and it was his duty to take the first opportunity of breaking it: that he had obtained the crown by the unanimous suffrages of the people; and should show himself totally unworthy of their favour, did he not strenuously maintain those liberties with which they had entrusted him; and that the duke, if he made any attempt by force of arms, should experience the power of an united nation, conducted by a prince, who, sensible of the obligations impos'd on him by his royal dignity, was determin'd, that the same moment should put a period to his life and to his government.

This answer was according to William's expectations; and therefore he had already made preparations for invading England. He was encouraged and assist'd in this enterprize by Howel count of Brittany, Baldwin earl of Flanders, the emperor Henry IV. and Pope Alexander II. The latter declar'd Harold a perjured usurper; denounc'd excommunication against him and his adherents; and the more to encourage William in his enterprizes, sent him a consecrated banner, and a ring with one of St Peter's hairs in it. Thus he was enabled to assemble a fleet of 3000 vessels, on board of which were embark'd 60,000 men, chosen from among those numerous supplies which were sent him from all quarters. Many eminent personages were enlist'd under

84
Harold suc-
ceeds Ed-
ward the
Confessor.

England. der his banners. The most celebrated were Eustace count of Boulogne, Aimeri de Thouars, Hugh d'Estaples, William d'Evreux, Geoffroy de Rotrou, Roger de Beaumont, William de Warenne, Roger de Montgomeri, Hugh de Grantmesnil, Charles Martel, and Geoffroy Gifford.

In order to embarrass the affairs of Harold the more effectually, William also excited Tosti, in concert with Halfager king of Norway, to infest the English coasts. These two having collected a fleet of 350 ships, sailed up the Humber, and disembarked their troops, who began to commit great depredations. They were opposed by Morcar earl or duke (B) of Northumberland, and Edwin earl of Mercia, who were defeated. Harold, on the news of this invasion, assembled a considerable army, engaged the enemy at Stamford, and after a bloody battle entirely defeated them. Tosti and Halfager were killed in the action, and all the fleet fell into the hands of the victors; but Harold generously allowed Olave the son of Halfager to depart with 20 vessels.

85
Defeats the Danes.

The king of England had scarce time to rejoice on account of his victory, when news were brought him that the Normans were landed in Suffex. Harold's victory had considerably weakened his army. He lost many of his bravest officers and soldiers in the action; and he disgusted the rest, by refusing to distribute the Danish spoils among them. He hastened, however, by quick marches, to repel this new invader; but though he was reinforced at London and other places with fresh troops, he found himself weakened by the desertion of his old soldiers, who, from fatigue and discontent, secretly withdrew from their colours. Gurth, the brother of Harold, a man of great conduct as well as bravery, became apprehensive of the event; and entreated the king to avoid a general engagement for some time, or at least not to hazard his person. But though this advice was in itself evidently proper, and enforced by all the arguments which Gurth could suggest, Harold continued deaf to every thing that could be said. Accordingly, on the 14th of October 1066, the two armies engaged near Hastings, a town of Suffex. After a most obstinate and bloody battle †, the English were entirely defeated, Harold and his two brothers killed, and William left master of the kingdom of England.

86
Is defeated and killed by William of Normandy.
† See Hastings.

Nothing could exceed the terror of the English upon the news of the defeat and death of Harold. As soon as William passed the Thames at Wallingford, Stigand, the primate, made submissions to him in the name of the clergy; and before he came within sight of London, all the chief nobility, and even Edgar Atheling himself, who, being the rightful heir to the throne, had just before been declared king, came and submitted to the conqueror. William very readily accepted of the crown upon the terms that were offered him; which were, that he should govern according to the established customs of the country. He could indeed have made what terms he pleased; but, though really a conqueror, he chose rather to be thought an elected king. For this reason he was crowned at Westminster by the archbishop of York, and took the oath administered to the former kings of England; namely,

87
William the Conqueror.

that he would protect and defend the church, observe the laws of the realm, and govern the kingdom with impartiality. England.

The English historians complain of the most grievous oppression by William and his Normans. Whether by his conduct the conqueror willingly gave the English opportunities of rebelling against him, in order to have a pretence for oppressing them afterwards, is not easy to say; but it is certain that the beginning of his reign cannot justly be blamed. The first disgust against his government was excited among the clergy. William could not avoid the rewarding of those numerous adventurers who had accompanied him in his expedition. He first divided the lands of the English barons who had opposed him, among his Norman barons; but as these were found insufficient, he quartered the rest on the rich abbays, of which there were many in the kingdom, until some other opportunity of providing for them offered itself.

88
The English grievously oppressed.

Though this last step was highly resented by the clergy, it gave very little offence to the laity. The whole nation, however, was soon after disgusted, by seeing all the real power of the kingdom placed in the hands of the Normans. He disarmed the city of London, and other places which appeared most warlike and populous, and quartered Norman soldiers wherever he dreaded an insurrection. This was indeed acting as a conqueror, and not as an elected king; but the event showed the necessity of such precautions. The king having thus secured, as he imagined, England from any danger of a revolt, determined to pay a visit to his Norman dominions. He appointed his brother Odo, bishop of Bayeux, and William Fitz-Osborne, regents in his absence; and to secure himself yet farther, he resolved to carry along with him such of the English nobility as he put the least confidence in.

Having taken all these methods to ensure the tranquillity of his new kingdom, William set sail for Normandy in March 1067; but his absence produced the most fatal consequences. Discontents and murmurings were multiplied everywhere; secret conspiracies were entered into against the government; hostilities were commenced in many places; and every thing seemed to threaten a speedy revolution. William of Poitiers, a Norman historian, throws the blame entirely on the English. He calls them a fickle and mutinous race, while he celebrates with the highest encomiums the justice and lenity of Odo's and Fitz-Osborne's administration. On the other hand, the English historians tell us, that these governors took all opportunities of oppressing the people, either with a view to provoke them to rebellion, or in case they tamely submitted to their impositions, to grow rich by plundering them. Be this as it will, however, a secret conspiracy was formed among the English for a general massacre of the Normans, like what had formerly been made of the Danes. This was prosecuted with so much animosity, that the vassals of the earl Coxo put him to death because he refused to head them in the enterprise. The conspirators had already taken the resolution, and fixed the day for their intended massacre, which was to be on Ash-Wednesday, during the time of divine service,

(B) Anciently these two titles were synonymous.

England. vice, when all the Normans would be unarmed as penitents, according to the discipline of the times. But the presence of William disconcerted all their schemes. Having got intelligence of their bloody purpose, he hastened over to England. Such of the conspirators as had been more open in their rebellion, consulted their safety by flight; and this served to confirm the proofs of an accusation against those who remained. From this time the king not only lost all confidence in his English subjects, but regarded them as inveterate and irreconcilable enemies. He had already raised such a number of fortresses in the country, that he no longer dreaded the tumultuous or transient efforts of a discontented multitude. He determined therefore to treat them as a conquered nation. The first instance of this treatment was his revival of the tax of Dane-gelt, which had been imposed by the Danish conquerors, and was very odious to the people. This produced great discontents, and even insurrections. The inhabitants of Exeter and Cornwall revolted; but were soon reduced, and obliged to implore the mercy of the conqueror. A more dangerous rebellion happened in the north; but this was also soon quashed, and the English became sensible that their destruction was intended. Their easy submission after the battle of Hastings had inspired the Normans with contempt; their commotions afterwards had rendered them objects of hatred; and they were now deprived of every expedient which could make them either regarded or beloved by their sovereign. Many fled into foreign countries; and among the rest Edgar Atheling himself, who made his escape to Scotland, and carried thither his two sisters Margaret and Christina. They were well received by Malcolm, who soon after married Margaret the elder sister, and also received great numbers of other exiles with the utmost kindness.

The English, though unable to make any resistance openly, did not fail to gratify their resentment against the Normans in a private manner. Seldom a day passed, but the bodies of assassinated Normans were found in the woods and highways, without any possibility of bringing the perpetrators to justice. Thus, at length, the conquerors themselves began again to wish for tranquillity and security; and several of them, though entrusted with great commands, desired to be dismissed the service. In order to prevent these desertions, which William highly resented, he was obliged to allure others to stay by the largeness of his bounties. The consequences were, fresh exactions from the English, and new insurrections on their part against their cruel masters. The Norman power, however, was too well founded to be now removed, and every attempt of the English to regain their liberty served only to rivet their chains the more firmly. The county of Northumberland, which had been most active in these insurrections, now suffered most severely. The whole of it was laid waste, the houses were burned, the instruments of agriculture destroyed, and the inhabitants forced to seek new places of abode. On this occasion it is said that above 100,000 persons perished either by the sword or famine; and the country is supposed, even to this day, to retain the marks of its ancient depopulation. The estates of all the English gentry were next confiscated, and bestowed on the Normans. By this means all the ancient and honourable families were re-

duced to beggary; and the English found themselves England. totally excluded from every road that led either to honour or preferment.

By proceeding in this manner, William at last broke the spirit of the English nation, and received no further trouble from them. In 1076, however, he found 89 Diffensions in William's family. that the latter part of his life was likely to be unhappy through diffensions in his own family. He had four sons, Robert, Richard, William, and Henry, besides several daughters. Robert, his eldest son, surnamed *Curthofe*, from the shortness of his legs, was a prince who inherited all the bravery and ambition of his family. He had formerly been promised by his father the government of the province of Maine in France, and was also declared successor to the dukedom of Normandy. He demanded from his father the fulfilment of these promises; but William gave him a flat denial, observing, that "it was not his custom to throw off his clothes till he went to bed." Robert declared his resentment; and openly expressed his jealousy of his two brothers William and Henry, (for Richard was killed, in hunting, by a stag). An open rupture was soon commenced. The two young princes one day took it into their heads to throw water on their elder brother as he passed through the court after leaving their apartment. Robert construed this frolic into a studied indignity; and having these jealousies still farther inflamed by one of his favourites, he drew his sword, and ran up stairs with an intent to take revenge. The whole castle was quickly filled with tumult, and it was not without some difficulty that the king himself was able to appease it. But he could not allay the animosity which from that moment prevailed in his family. Robert, attended by several of his confederates, withdrew to Rouen that very night, hoping to surprize the castle; but his design was defeated by the governor. The popular character of the prince, however, engaged all the young nobility of Normandy, as well as of Anjou and Brittany, to espouse his quarrel; even his mother is supposed to have supported him in his rebellion by secret remittances. The unnatural contest continued for several years; and William was at last obliged to have recourse to England for support against his own son. Accordingly, he drew an army of Englishmen together; he led them over to Normandy, where he soon compelled Robert and his adherents to quit the field, and was quickly reinstated in all his dominions. Robert then took shelter in the castle of Gerberoy, which the king of France had provided for him, where he was shortly after besieged by his father. As the garrison was strong, and conscious of their treason, they made a gallant defence; and many skirmishes and duels were fought under its walls. In one of these the king and his son happened to meet; but being both concealed by their helmets, they attacked each other with mutual fury. The young prince wounded his father in the arm, and threw him from his horse. The next blow would probably have put an end to his life, had he not called for assistance. Robert instantly recollected his father's voice, leaped from his horse, and raised him from the ground. He prostrated himself in his presence, asked pardon for his offences, and promised for the future a strict adherence to his duty. The king was not so easily appeased; and perhaps his resentment was heightened by

England. by the disgrace of being overcome. He therefore gave his malediction to his son; and returned to his own camp on Robert's horse, which he had assisted him to mount. After some recollection, however, he was reconciled to Robert, and carried him with him into England.

William returned in 1081; and being now freed from his enemies both at home and abroad, began to have more leisure to attend to his own domestic affairs. For this purpose the *DOOMSDAY-BOOK* was composed by his order, of which an account is given under that article. He reserved a very ample revenue for the crown; and in the general distribution of land among his followers, kept possession of no fewer than 1400 manors in different parts of the country. No king of England was ever so opulent; none was able to support the splendor and magnificence of a court to such a degree; none had so many places of trust and profit to bestow; and consequently none ever had such implicit obedience paid to his commands. He delighted greatly in hunting; and to indulge himself in this with the greater freedom, he depopulated the county of Hampshire for 30 miles, turning out the inhabitants, destroying all the villages, and making the wretched outcasts no compensation for such an injury. In the time of the Saxon kings, all noblemen without distinction had a right to hunt in the royal forests; but William appropriated all these to himself, and published very severe laws to prohibit his subjects from encroaching on this part of his prerogative. The killing of a boar, a deer, or even a hare, was punished with the loss of the delinquent's eyes; at the time when the killing of a man might be atoned for by paying a moderate fine or composition.

As the king's wealth and power were so great, it may reasonably be supposed that the riches of his ministers were in proportion. Odo, bishop of Bayeux, William's brother, was become so rich, that he resolved to purchase the papacy. For this purpose, taking the opportunity of the king's absence, he equipped a vessel in the isle of Wight, on board of which he sent immense treasures, and prepared for his embarkation. He was detained, however, by contrary winds; and, in the mean time, William, being informed of his designs, resolved to prevent the exportation of so much wealth from his dominions. Returning therefore from Normandy, where he was at that time, he came to England the very instant his brother was stepping on board. He immediately ordered him to be made prisoner: but his attendants, respecting the bishop's ecclesiastical character, scrupled to execute his commands; so that the king was obliged to seize him with his own hand. Odo appealed to the Pope: but the king replied, that he did not seize him as bishop of Bayeux, but as earl of Kent; and, in that capacity, he expected, and would have, an account of his administration. He was therefore sent prisoner to Normandy; and, notwithstanding all the remonstrances and threats of Pope Gregory, was detained in custody during the remainder of William's reign.

90
Death of
the queen;

Soon after this, William felt a severe blow in the death of Matilda his queen; and, almost at the same time, received information of a general insurrection in Maine, the nobility of which had always been averse to his government. Upon his arrival on the continent, he

found that the insurgents had been secretly assisted and excited by the king of France, who took all opportunities of lessening the Norman power, by creating dissensions among the nobles. His displeasure on this account was very much increased, by notice, he received of some railleries thrown out against him by the French monarch. It seems that William, who was become corpulent, had been detained in bed some time by sickness; and Philip was heard to say, that he only lay in of a big belly. This so provoked the English monarch, that he sent him word, he would soon be up, and would, at his churching, present such a number of tapers as would set the kingdom of France in a flame.

To perform this promise, he levied a powerful army; and, entering the Isle of France, destroyed every thing with fire and sword. He took the town of Mante, and reduced it to ashes. But a period was soon put to the conquests and to the life of this great warrior by an accident. His horse happening to put his fore feet on some hot ashes, plunged so violently, that the rider was thrown forward, and bruised his belly on theommel of the saddle. Being now in a bad habit of body, as well as somewhat advanced in years, he began to be apprehensive of the consequences, and ordered himself to be carried in a litter to the monastery of St Gervais. Finding his illness increase, and being sensible of the approach of death, he discovered at last the vanity of all human grandeur; and was struck with remorse for those many cruelties and violences of which he had been guilty. He endeavoured to make compensation by presents to churches and monasteries, and gave orders for the liberation of several English noblemen. He was even prevailed upon, though not without reluctance, to release his brother Odo, against whom he was very much incensed. He left Normandy and Maine to his eldest son Robert. He wrote to Lanfranc the primate of England, desiring him to crown William king of England. To Henry he bequeathed nothing but the possessions of his mother Matilda; but foretold, that one day he would surpass both his brothers in power and opulence. He expired on the 9th September 1087, in the 63d year of his age, in the 21st of his reign over England, and 54th of that over Normandy.

William, surnamed *Rufus*, from his red hair, was in Normandy at the time of his father's illness. He no sooner received the letter for Lanfranc, than, leaving his father in the agonies of death, he set out for England; where he arrived before intelligence of the decease of the Conqueror had reached that kingdom. Being sensible that his brother Robert, as being the eldest son, had a preferable title to himself, he used the utmost dispatch in getting himself firmly established on the throne. The English were so effectually subdued, that they made no opposition; but the Norman barons were attached to Robert. This prince was brave, open, sincere, and generous; and even his predominant fault of indolence was not disagreeable to those haughty barons, who affected an almost total independence of their sovereign. The king, on the other hand, was violent, haughty, and tyrannical. A powerful conspiracy was therefore carried on against William; and Odo, bishop of Bayeux, undertook to conduct it. Many of the most powerful nobility were concerned; and

England.

91
And of the
king.

92
William
Rufus.

England. as the conspirators expected to be in a short time supported by powerful succours from Normandy, they retired to their castles, and put themselves in an offensive posture.

William, sensible of his danger, engaged the English on his side, by promising some mitigation of their hardships, and liberty to hunt in the royal forests. Robert, in the mean time, through his natural indolence, neglected to give his allies proper assistance. The conspirators were obliged to submit. Some of them were pardoned; but most of them confiscated, and their estates bestowed on the barons who had continued faithful to the king.

93
Proves a
tyrant.

William, freed from this danger, thought no more of his promises to the English. He proved a greater tyrant than his father; and, after the death of Lanfranc, who had been his preceptor, and kept him within some bounds, he gave full scope to his violent and rapacious disposition. Not content with oppressing the laity, he invaded the privileges of the church; which, in those days, were held most sacred. He seized the temporalities of all the vacant bishoprics and abbeys, and openly put to sale those fees and abbeys which he thought proper to dispose of.

94
Attempts
the conquest
of
Normandy.

These proceedings occasioned great murmurs among the ecclesiastics, which were quickly spread through the nation, but the terror of William's authority preserved the public tranquillity. In 1090, the king thought himself strong enough to attempt the conquest of Normandy, which at that time was in the greatest confusion through the indolent and negligent administration of Robert. Several of the barons had revolted, and these revolts were encouraged by the king of France. Robert also imagined he had reason to fear the intrigues of his other brother Henry, whom for 3000 merks he had put in possession of *Cotentin*, near a third part of the duchy of Normandy. He therefore threw him into prison; but finding himself threatened with an invasion from the king of England, he gave Henry his liberty, and even made use of his assistance in suppressing the insurrections of his rebellious subjects. William, however, was no sooner landed in Normandy, than the nobility on both sides interposed, and a treaty of peace was concluded. In this treaty Henry finding his interests entirely neglected, retired to St Michael's Mount, a strong fortress on the coast of Normandy, and infested the neighbourhood with his incursions. He was besieged by his two brothers, and obliged to capitulate in a short time; after which, being deprived of all his dominions, he wandered about for some time with very few attendants, and often in great poverty.

The peace with Robert was of no long duration. In the interval some hostilities with Scotland succeeded, and these terminated in the death of Malcolm king of that country; after which new broils ensued with Normandy. The rapacious temper of William prompted him to encroach upon his brother's territories, and the same rapacity prompted him to use a very extraordinary expedient in order to accomplish his designs. Having gone over to Normandy to support his partisans, he ordered an army of 20,000 men to be raised in England, and conducted to the sea-coast as if they were to be immediately embarked: but when they came there, instead of embarking, they were forced to pay the king ten shillings a man; after which they were dismissed to their

England. several counties. With this money William engaged the king of France to depart from the protection of Robert; and also bribed many of the Norman barons to revolt. He was called from Normandy, however, by an irruption of the Welsh; and having repulsed them, he was prevented from attempting other enterprises by a conspiracy of his barons.

In 1096, however, the superstition of Robert put ⁹⁵ the king of England in possession of those dominions ^{Purchases the duchy for 10,000 merks.} which he had not been able to conquer by force of arms. The crusades were now commenced, and Robert was desirous of undertaking an expedition into the Holy Land. As money for this purpose was wanting, he mortgaged his dominions to his brother for 10,000 merks. The king raised the money by violent extortions on his subjects; forcing even the convents to melt their plate, in order to furnish the quota demanded of them. He was then put in possession of Normandy and Maine; and Robert with a magnificent train set out for the Holy Land.

After the death of Lanfranc, the king had retained in his own hands the revenues of Canterbury, as he had done those of many other bishoprics; but falling into a dangerous illness, he was seized with remorse; and the clergy represented to him that he was in danger of eternal perdition if he did not make atonement for those impieties and sacrileges of which he had been guilty. He therefore instantly resolved to supply the vacancy of Canterbury: he sent for Anselm, a Piedmontese by birth, abbot of Bec in Normandy, who was much celebrated for his piety and devotion. The abbot refused the dignity with great earnestness; fell on his knees, wept, and intreated the king to change his purpose; and when he found him obstinate in forcing the pastoral staff upon him, he kept his fist so hard clenched, that it required the utmost violence of the bystanders to open it, and force him to receive that ensign of his spiritual dignity. William soon after recovered his ⁹⁶ health, and with it his violence and rapacity. As he ^{His quarrel with the primate.} now spared the church no more than before, a quarrel with the primate. with Anselm soon ensued; and this was the more dangerous to the king, on account of the great character for piety which the primate had acquired by his zeal against abuses of all kinds, particularly those of dress and ornament.

At this time there was a mode which prevailed not only in England, but throughout Europe, both among men and women, of giving an enormous length to their shoes, drawing the toe to a sharp point, and affixing to it the figure of a bird's bill, or some such ornament, which was turned upwards, and which was often sustained by gold or silver chains tied to the knee. The ecclesiastics took exception at this ornament, which they said was an attempt to belie the Scripture, where it is affirmed, that no man can add a cubit to his stature; and they not only declaimed against it with vehemence, but assembled some synods, in which the fashion was absolutely condemned. Such, however, are the contradictions in human nature, that all the influence of the clergy, which at that time was sufficient to send vast multitudes of people into Asia to butcher one another, was not able to prevail against those long-pointed shoes. The fashion, contrary to what hath happened to almost all others, maintained its ground for several centuries; and even Anselm found his endeavours

England. deavours against it ineffectual. He was more successful in decrying the long hair and curled locks then worn by the courtiers. He refused the ashes on Ash-Wednesday to such as were so accoutred; and his authority and eloquence had such influence, that the young men universally abandoned that ornament, and appeared in the cropt hair recommended to them by the sermons of the primate. For this reformation Anselm is highly celebrated by his historian Eadmer, who was also his companion and secretary.

the woods by the country-people, and buried without ceremony at Winchester. England.

After the death of William, the crown of right devolved to Robert his eldest brother; for William had no legitimate children. But what Robert had formerly lost by his indolence, he was again deprived of by his absence at the holy war. Prince Henry was in the forest with William Rufus at the time the latter was killed. He no sooner heard the important news, Prince Henry usurps the crown. than he hurried to Winchester, and secured the royal treasure. William de Breteuil, keeper of the treasure, arrived almost the same instant, and opposed his pretensions; telling him, that the treasure belonged to his elder brother, who was now his sovereign, and for whom he was determined to keep it. But Henry, drawing his sword, threatened him with instant death if he dared to disobey him; and others of the late king's retinue, who came every moment to Winchester, joining the prince's party, he was obliged to desist. Henry lost no time in fully accomplishing his purpose. In less than three days he got himself crowned king of England by Maurice bishop of London. Present possession supplied every deficiency of title; and no one dared to appear in defence of the absent prince.

* See Anselm.

97 Who leaves the kingdom.

When William's profaneness returned with his health, he was engaged in almost perpetual contests with this austere prelate*. These were pretty well settled, when the king, who had undertaken an expedition into Wales, required Anselm to furnish him with a certain number of soldiers. The primate regarded this as an invasion of the rights of the church; and therefore, though he durst not refuse compliance, sent the men so miserably accoutred, that the king was exceedingly displeased, and threatened him with a prosecution. Anselm demanded restitution of all his revenues which the king had seized, and appealed to the pope. The quarrel, however, ran so high, that the primate found it dangerous to remain in England. He desired and obtained the king's permission to retire beyond sea. His temporalities were confiscated immediately on his departure; but Pope Urban received him as a martyr in the cause of religion, and even threatened the king with sentence of excommunication. William, however, proceeded in his projects of ambition and violence, without regarding the threats of the pope; who he knew was at that time too much engaged with the crusades to mind any other business. Though his acquisition of Maine and Normandy had brought him into perpetual contests with the haughty and turbulent barons who inhabited those countries, and raised endless tumults and insurrections; yet William seemed still intent on extending his dominions either by purchase or conquest. William earl of Poitiers and duke of Guienne had resolved upon an expedition to the Holy Land; and, for this purpose, had put himself at the head of a vast multitude, consisting, according to some historians, of 60,000 horse, and a much greater number of foot. Like Robert of Normandy, he offered to mortgage his dominions for money sufficient to conduct this multitude into Asia. The king accepted his offer; and had prepared a fleet and army to take possession of these dominions, when an unfortunate accident put an end to his projects and his life. He was engaged in hunting, the sole amusement, and indeed the principal occupation, of princes in those rude times. Walter Tyrrel, a French gentleman remarkable for his skill in archery, attended him in this recreation, of which the new forest was the scene. William had dismounted after a chase; and Tyrrel, impatient to show his dexterity, let fly an arrow at a stag which suddenly started before him. The arrow glanced from a tree, and struck the king to the heart. He instantly fell down dead; and Tyrrel, terrified at the accident, clapt spurs to his horse, hastened to the sea-shore, and embarked for France, where he joined the crusade that was setting out from that country. This happened on the 2d of August 1100, after the king had reigned 13 years, and lived about 40. His body was found in

98 Death of the king.

The beginning of King Henry's reign promised to be favourable to the English liberty; owing chiefly to his fear of his brother. To conciliate the affections of his subjects, he passed a charter calculated to remove many of the grievous oppressions which had been complained of during the reigns of his father and brother. He promised, that at the death of any abbot or bishop, he never would seize the revenues of the see or abbey during the vacancy, but would leave the whole to be reaped by the successor; and that he would never let to farm any ecclesiastical benefice, or dispose of it for money. To the laity he promised, that, upon the death of any earl, baron, or military tenant, his heir should be admitted to the possession of his estate, on paying a just and lawful relief; without being exposed to those enormous exactions which had been formerly required. He remitted the wardship of minors; and allowed guardians to be appointed, who should be answerable for the trust. He promised not to dispose of any heiress in marriage but by advice of all the barons; and if any baron intended to give his daughter, sister, niece, or kinswoman in marriage, it should only be necessary for him to consult the king, who promised to take no money for his consent, nor ever to refuse permission, unless the person to whom it was proposed to marry her should happen to be his enemy. He granted his barons and military tenants the power of bequeathing by will their money or personal estates; and if they neglected to make a will, he promised that their heirs should succeed to them. He renounced the right of imposing moneyage, and of levying taxes at pleasure, on the farms which the barons kept in their own hands. He made some general professions of moderating fines; he offered a pardon for all offences; and remitted all debts due to the crown. He also required, that the vassals of the barons should enjoy the same privileges which he granted to his own barons; and he promised a general confirmation and observance of the laws of King Edward*. To give greater authenticity to these concessions, a

100 His charter in favour of the people. * See Feodal System.

copy

^{England.} copy of the charter was lodged in some abbey of each county.

¹⁰¹
Quartels
with the
primate.

King Henry, farther to increase his popularity, degraded and committed to prison Ralph Flambard bishop of Durham, who had been the chief instrument of oppression under his brother. He sent for Anselm who was then at Lyons, inviting him to return and take possession of his dignities. Anselm returned; but when Henry proposed to him to do the same homage to him which he had done to his brother, the king met with an absolute refusal. During his exile, Anselm had assisted at the council of Bari; where, besides fixing the controversy between the Greek and Latin churches concerning the procession of the Holy Ghost, the right of election to church-preferments was declared to belong to the clergy alone, and spiritual censures were denounced against all ecclesiastics who did homage to laymen for their fees and benefices, and on all laymen who exacted it. The rite of homage † by the feudal customs was, that the vassal should throw himself on his knees, put his joined hands between those of his superior, and should in that posture swear fealty to him. But the council declared it execrable, that pure hands, which could create God, and offer him up for the salvation of mankind, should be put, after this humiliating manner, between profane hands, which, besides being inured to rapine and bloodshed, were employed day and night in impure purposes and obscene contacts. To this decree therefore Anselm appealed; and declared, that so far from doing homage for his spiritual dignity, he would not even communicate with any ecclesiastic who paid that submission, or who accepted of investitures from laymen. Henry durst not insist; and therefore desired that the controversy might be suspended, and that messengers might be sent to Rome to accommodate matters with the Pope, and to obtain his confirmation of the laws and customs of England.

† See Feo-
dal Tenure.

Henry now took another step which seemed capable of confirming his claims to the crown without any danger of a rival. The English remembered with regret their Saxon monarchs, when they compared the liberty they enjoyed under them with the tyranny of the Normans. Some descendants of that favourite line still remained; and among the rest, Matilda, the niece of Edgar Atheling. Upon her the king fixed his eyes as a proper consort, by whose means the breach between the Saxons and Normans might be cemented. A difficulty, however, occurred, because she had been educated in a nunnery. The affair was examined by Anselm in a council of prelates and nobles summoned at Lambeth. Matilda there proved, that she had put on the veil, not with a design of entering into a religious life, but merely in imitation of a custom familiar to the English ladies, who protected their chastity from the brutal violence of the Normans by taking shelter under that habit, which amid the horrid licentiousness of the times was yet generally revered. The council, sensible that even a princess had otherwise no security for her honour, admitted this reason as valid. They pronounced that Matilda was still free to marry; and her nuptials with Henry were celebrated by Anselm with great solemnity and pomp.

¹⁰²
He marries
Matilda.

While Henry was thus rendering himself popular at home, his brother Robert, who had loitered away a

twelvemonth in Italy, where he married Sibylla daughter of the count of Conversana, arrived in England, in 1101, in order to put in his late and ineffectual claim to the crown. His fame, however, on account of the exploits he had performed in Palestine, was so great, that even yet he was joined by many noblemen of the first rank, and the whole nation seemed prepossessed in his favour. But Henry, having paid his court to Anselm, by his means retained the army in his interests, and marched with them to Portsmouth, where Robert had landed his forces a few days before. The armies lay for some time in sight of each other; when an accommodation was effected through the mediation of Anselm and other great men. By this treaty it was agreed, that Robert should resign his pretensions to England, and receive in lieu of them an annual pension of 3000 marks; that if either of the princes died without issue, the other should succeed to his dominions; that the adherents of each should be pardoned, and restored to all their possessions either in Normandy or England; and that neither Robert nor Henry should thenceforth encourage, receive, or protect the enemies of each other.

^{England.}
¹⁰³
Crown of
England
claimed by
Robert.

The two princes separated with mutual marks of friendship; but next year, Henry, under various pretences, confiscated the estates of almost all the noblemen who had favoured his brother's pretensions. Robert, enraged at the fate of his friends, ventured to come to England in order to remonstrate with his brother in person. But he met with such a bad reception, that, apprehending his liberty to be in danger, he was glad to make his escape by resigning his pension.

This infringement of the treaty was followed the ensuing year by an invasion of Normandy, at the desire of Robert's own subjects, whom he was totally incapable of governing*. The event of this war was the defeat and captivity of Robert, who was henceforth deprived not only of all his dominions, but of his personal liberty. He lived 28 years a prisoner, and died in the castle of Cardiff in Glamorganshire. It is even said by some, that he was deprived of his sight by a red-hot copper basin applied to his eyes, and that King Henry appeased his conscience by founding the monastery of Reading.

¹⁰⁴
Normandy
invaded by
Henry.

* See Nor-
mandy.

The conquest of Normandy was completed in 1106; and next year the controversy between the king and primate, concerning the investitures of clergymen and their doing homage to princes, was resumed. The king was very sensible that it was not his interest to quarrel with such a powerful body as the clergy were at that time; and on the other hand, he fully understood the necessity of guarding the prerogatives of the crown from their encroachments. While, therefore, he avoided an open rupture with Anselm, he obstinately refused to give up the privileges which had been enjoyed by his predecessors. On the first arrival of Anselm, the king had avoided the dispute in the manner already mentioned. A messenger was dispatched to Rome, in order to compromise matters with the pope. The messenger returned with an absolute refusal of the king's demands. One of the reasons given by the pope on this occasion was expressed in the following words: "It is monstrous that a son should pretend to beget his father, or a man to create his God: priests are

¹⁰⁵
Qua rels
with the
primate.

called

England. called *gods* in scripture, as being the vicars of God: and will you, by your abominable pretensions to grant them their investiture, assume the right of creating them?" Henry was not yet convinced; but as he was determined to avoid, or at least to delay, the coming to any dangerous extremity with the church, he persuaded Anselm, that by farther negotiation he should be able to compound matters with the pope. Messengers were therefore dispatched to Rome a second time from the king; and also from Anselm, who wanted to be fully assured of the pope's intentions. They returned with letters wrote in the most arrogant and positive manner, both to the king and primate. The king suppressed the letter sent to himself; and persuaded the three bishops, by whom it was sent, to assert, upon their episcopal faith, that the pope had assured them of his private good intentions towards King Henry, and of his resolution not to resent any future exertion of his prerogative in granting investitures; though he himself scrupled to give this assurance under his hand, lest other princes should copy the example and assume a like privilege. Anselm's two messengers, who were monks, affirmed that it was impossible this story could have any foundation; but their word was not deemed equivalent to that of three bishops; and the king, as if he had finally gained his cause, proceeded to fill the sees of Hereford and Salisbury, and to invest the new bishops in the usual manner. Anselm, however, gave no credit to the assertions of the king's messengers; and therefore refused not only to consecrate them, but even to communicate with them; and the bishops themselves, finding they were become universally odious, returned the ensigns of their spiritual dignity.

The quarrel continued between the king and primate, till the latter, sensible of his dangerous situation, desired leave to make a journey to Rome, in order to lay the case before the pope. This permission was easily obtained; but no sooner was the primate gone, than Henry confiscated all his revenues, and sent another messenger to negotiate with the pope. The new messenger told his holiness, that his master would sooner part with his crown than the right of granting investitures. "And I (replied the pope) would rather lose my head than allow him to retain it." This quarrel now became very dangerous to the king; as he was threatened by the pope with excommunication, which would have been attended with terrible consequences. At last, however, a compromise was made in the following manner. Before bishops took possession of their dignities, they had formerly been accustomed to pass through two ceremonials: They received, from the hands of the sovereign, a ring and crozier as the symbols of their office, and this was called their *investiture*: they also made those submissions to the prince, which were required of the vassals by the rites of the feudal law, and which received the name of *homage*. The pope, therefore, was for the present contented with Henry's resigning his right of granting investitures, by which the spiritual dignity was supposed to be conferred; and he allowed the bishops to do homage for their temporal properties and privileges. After this, the pope allowed Anselm to communicate with the prelates who had already received investitures from the crown; and he only required of them some

VOL. VIII. Part I.

England. submissions for their past conduct. He also granted to Anselm a plenary power of remedying every disorder, which he said might arise from the barbarousness of the country. About the same time the marriage of priests was prohibited; and even laymen were not allowed to marry within the seventh degree of affinity. By this contrivance the pope augmented the profits which he reaped from granting dispensations, and likewise those from divorces. For as the art of writing was then rare, and parish-registers were not regularly kept, it was not easy to ascertain the degrees of affinity even among people of rank; and any man who had money to pay for it, might obtain a divorce, on pretence that his wife was more nearly related to him than was permitted by the canons. A decree was also published, prohibiting the clergy to wear long hair; and the king, though he would not resign his prerogatives to the church, very willingly cut his hair in the form which was required of him, obliging all the courtiers at the same time to follow his example.

From the time of this compromise, which happened in 1107, to the year 1120, nothing remarkable happened except some slight commotions in Normandy; but this year, Prince William, the king's only son, was unfortunately drowned off the coast of Normandy; ¹⁰⁶ Prince and Henry was so much affected, that he is said never ^{William} afterwards to have smiled or recovered his wonted ^{drowned.} cheerfulness. It is very doubtful, however, whether the death of this prince was not an advantage to the British nation, since he was often heard to express the utmost hatred to the natives; insomuch that he had threatened, that when he came to the throne, he would make them draw the plough, and would turn them into beasts of burden. These prepossessions he inherited from his father; who, though he was wont, when it might serve his purposes, to value himself on his birth as a native of England, showed, in the course of his government, an extreme prejudice against that people. All hopes of preferment to ecclesiastical as well as civil dignities were denied to the English during this whole reign; and any foreigner, however ignorant or worthless, was sure to have the preference in every competition. The charter formerly mentioned, which the king granted at the beginning of his reign, was no more thought of; and the whole fell so much into neglect and oblivion, that in the following century, when the barons, who had heard an obscure tradition of it, desired to make it the model of the great charter which they exacted from King John, they could only find one copy of it in the whole kingdom; while the grievances, proposed to be redressed by it, continued still in their full extent.

As Henry had now no legitimate children except Matilda, whom in 1110 he had betrothed, though only eight years of age, to the emperor of Germany, he was induced to marry a second time in hopes of having sons. He made his addresses accordingly to Adalais the daughter of Godfrey duke of Lovaine, and niece to Pope Calixtus; a young princess of an amiable person. But Adalais brought him no children: and in 1135, the king died in Normandy, from eating ¹⁰⁷ too plentifully of lampreys; having lived 67 years, and ^{Death of King Henry} reigned 35. ^{ry.}

By the will of King Henry, his daughter Matilda became heiress of all his dominions. She had been married,

England. married, after her first husband's death, to Geoffrey Plantagenet, eldest son of the count of Anjou, by whom she had a son named *Henry*; but as Geoffrey had given umbrage to the king of England in several instances, no notice was taken of him in the will. The nobility had already sworn fealty to her; and the foremost to show this mark of submission to the king's will had been Stephen, son of the count of Blois (who had married Adela the daughter of William the Conqueror). He had been married to Matilda, daughter and heiress of Eustace count of Boulogne; who brought him, besides that feudal sovereignty of France, a vast property in England, which in the distribution of lands had been conferred by the Conqueror on the family of Boulogne. By this marriage Stephen acquired a new connection with the royal family of England: for Mary, his wife's mother, was sister to David the present king of Scotland, and to Matilda the first wife of Henry and mother of the empress. The king also, imagining that by the aggrandizement of Stephen he strengthened the interest of his own family, had enriched him with many possessions; but instead of this, it appeared by the event that he had only put it more and more in his power to usurp the throne.

108
Stephen usurps the throne.

No sooner was Henry dead, than Stephen hastened from Normandy into England. The citizens of Dover and Canterbury, apprised of his purpose, shut their gates against him; but when he arrived at London, some of the lower class of people, instigated by his emissaries, immediately proclaimed him king. The archbishop of Canterbury refused to give him the royal unction; but this difficulty was got over by Stephen's brother, the bishop of Winchester. Hugh Bigod, steward of the household, made oath before the primate, that the late king, on his death-bed, had discovered a dissatisfaction with his daughter Matilda, and had expressed his intention of leaving the count of Boulogne heir to all his dominions; and the bishop either believing, or pretending to believe, this testimony, gave Stephen the royal unction. Very few of the nobility attended his coronation; but none opposed his usurpation, however unjust or flagrant.

Stephen, in order to establish himself on the throne as firmly as possible, passed a charter, in which he made liberal promises to all ranks of men. To the clergy he promised, that he would speedily fill all the vacant benefices, and never would levy any of the rents during the vacancy. To the nobility he gave liberty to hunt in their own forests; and to the people he promised to remit the tax of danegelt, and to restore the laws of Edward the Confessor. He seized the king's treasure at Winchester, amounting to 100,000*l.*; with part of which money he hired mercenary soldiers from the continent; and with another part procured a bull from the pope, confirming his title to the English throne.

Matilda, in the mean time, endeavoured to recover her just rights, of which Stephen had deprived her; but for some time she met with no success either in England or Normandy. Her husband Geoffrey himself was obliged to conclude a peace with Stephen, on condition of the king's paying him during that time an annual pension of 5000*l.*

Robert earl of Gloucester was the first who shook the power of Stephen. He was natural son to the late

king; a man of great honour and ability, and was very much attached to the interests of Matilda. When Stephen usurped the throne, he offered to do him homage, and take the oath of fealty; but with an express condition, that the king should maintain all his stipulations, and never invade any of Robert's rights or dignities. With this condition Stephen was obliged to comply, on account of the great power of that nobleman, though he knew that it was meant only to afford him a favourable opportunity of revolting when occasion served. The clergy imitated Robert's example; and annexed to their oath of allegiance the following condition, namely; that they were only bound as long as the king defended the ecclesiastical liberties, and supported the discipline of the church. The barons, in return for their submission, exacted terms of still more pernicious tendency. Many of them required to have the right of fortifying their castles, and putting themselves in a posture of defence; and with this exorbitant demand the king was forced to comply. All England was immediately filled with these fortresses; which the noblemen garrisoned either with their vassals, or with licentious soldiers, who flocked to them from all quarters. The whole kingdom now became a scene of rapine and devastation. Wars were carried on by the nobles in every quarter; the barons even assumed the right of coining money, and of exercising, without appeal, every act of jurisdiction; and the inferior gentry, as well as the people, finding no defence from the laws, during this total dissolution of sovereign authority, were obliged, for their immediate safety, to pay court to some neighbouring chieftain, and to purchase his protection, both by submitting to his exactions, and by assisting him in his rapine upon others.

109
Distracted state of the kingdom.

In 1137, the earl of Gloucester having projected an insurrection, retired beyond sea, sent the king a defiance, and solemnly renounced his allegiance. The next year David king of Scotland appeared with an army in defence of his niece's title; and penetrating into Yorkshire, committed the greatest devastations. He was defeated, however, with great slaughter, at Northallerton, by some of the northern barons, who had raised a powerful army; and this success so much overawed the malecontents in England, that Stephen's power might have received some stability, had he not unfortunately engaged himself in a contest with the clergy. He had already seen the mischief arising from the liberty he had granted of fortifying so many castles in different parts of the kingdom. He therefore determined to abridge this liberty as much as possible; and for that purpose he began with the castles erected by the clergy, who seemed to have less right to these military securities than the barons. Taking advantage therefore of a fray which had arisen at court between the retinue of the bishop of Salisbury and the earl of Brittany, he seized the bishops both of Salisbury and Lincoln, threw them into prison, and obliged them to deliver up the castles which they had lately erected. This produced such a violent commotion, that the opportunity seemed favourable to the pretensions of Matilda. On the 22d of September 1139, she landed in England with Robert earl of Gloucester, attended only by 140 knights; but her partizans daily increased, and she was soon in a condition to face Stephen

110
Matilda lands in England.

England. Stephen with equal forces in the field. Numberless encounters happened, the detail of which could afford very little entertainment to the reader. War was spread through every quarter; and the turbulent barons having, in a great measure, shaken off all restraint of government, and now obtained the sanction of fighting in the cause of their country, redoubled their oppressions, tyrannies, and devastations. The castles of the nobility became receptacles of licensed robbers; who, sallying forth day and night, spoiled the open country, plundered the villages, and even cities. They tortured the captives to make them reveal their treasures, sold their persons to slavery; and set fire to the houses, after they had pillaged them of every thing valuable. In consequence of this destruction, the land was left untilled; the instruments of husbandry were abandoned; and a grievous famine reduced the nation to the most deplorable state that can be imagined.

111 Stephen de-
feated and
taken pri-
soner.

After a multitude of indecisive conflicts, a battle ensued which seemed likely to ensure the public peace for some time. Stephen had marched his forces to relieve the city of Lincoln; the earl of Gloucester led a body of troops to assist those of Matilda's party, who were besieging that place. The two armies engaged on the 2d of February within sight of the city, and a desperate battle ensued. At last Stephen's army was defeated. He himself was for some time left without attendants; and fought on foot in the midst of his enemies, assaulted by multitudes, and resisting all their efforts with astonishing intrepidity. Being hemmed in on every side, he forced a way for some time with his battle-axe; but that breaking, he drew his sword, and with it furiously assailed his antagonists for some time longer. But at length the sword also flying in pieces, he was obliged to surrender himself a prisoner. He was conducted to Gloucester; and though at first treated with respect, he was in a short time, upon some suspicions, thrown into irons.

112
Matilda
crowned.

About a month after, Matilda was crowned at Winchester with great solemnity; but soon showed herself totally incapable of governing such a turbulent nation. She determined to repress the power of the nobles, who had now left only the shadow of authority to their sovereign. But being destitute of policy or prudence sufficient to accomplish so difficult an undertaking, a conspiracy was soon formed against her, and the bishop of Winchester detached a party of his friends and vassals to block up the city of London where the queen resided. At the same time measures were taken to infligate the Londoners to a revolt, and to seize the queen's person. Matilda, having timely notice of this conspiracy, fled to Winchester. Here she was soon after besieged by the bishop: but the town being distressed by famine, she with difficulty made her escape; while her brother the earl of Gloucester, endeavouring to follow, was taken prisoner, and exchanged for Stephen.

113
Stephen
restored.

Matilda was now obliged to take shelter in Oxford, while Stephen reascended the throne. The civil war broke out with redoubled fury. Many battles were fought, and both parties were involved in many distresses. Matilda escaped from Oxford at a time when the fields were covered with snow, by being dressed all in white, with four knights her attendants dressed in the same colour. Another time Stephen was surpris-

by the earl of Gloucester at Wilton, and made his escape with the utmost difficulty. At last Matilda was obliged to quit the kingdom; and the death of the earl of Gloucester soon after seemed to give a fatal blow to her interests. In 1153, however, Prince Henry, Matilda's son by her second husband Geoffrey, came over to England, in order once more to dispute Stephen's pretensions to the crown. After some success on his first landing, he was opposed by Stephen with a powerful army, and matters seemed likely to come to the decision of a general engagement. But while the two armies continued within a quarter of a mile of each other, a treaty was set on foot by the interposition of William earl of Arundel, for terminating the dispute in an amicable manner. The death of Eustace, Stephen's son, whom he had designed for the throne, which happened during the course of the treaty, facilitated its conclusion. It was agreed, that Stephen should reign during his life, and that justice should be administered in his name; that Henry, on Stephen's death, should succeed to the kingdom; and that William, Stephen's son, should inherit Boulogne and his patrimonial estate. This treaty filled all Europe with joy; and after the barons had sworn to it, Henry left England, and Stephen returned to the peaceable enjoyment of his throne. His reign, however, was but of short continuance; his death happening on the 25th of October 1154.

114
His death.

Henry was on the continent besieging a castle of one of the mutinous barons, when news was brought him of Stephen's death. But, as he was sensible of the goodness of his title, he did not abandon his enterprise till the place was reduced. He then set out on his journey, and was received in England with the utmost joy. The first acts of his reign seemed to promise a happy and prosperous administration. He instantly dismissed the mercenary soldiers who had committed the greatest disorders throughout the nation. He ordered all the castles which had been erected since the death of Henry I. to be demolished, except a few which he retained in his own hands for the protection of the kingdom. The adulterated coin which had been struck during the reign of Stephen was cried down, and new money struck of the right value and standard. He resumed many of those benefactions which had been made to churches and monasteries in the former reigns. He gave charters to several towns, by which the citizens claimed their freedom and privileges independent of any superior but himself. These charters were the ground-work of the English liberty; for thus a new order, namely, the more opulent of the people, began to claim a share in the administration, as well as the nobility and clergy. Thus the feudal government was at first impaired; and liberty began to be more equally diffused throughout the nation.

Henry II. on his accession to the English throne, found himself possessed of very extensive dominions on the continent. In the right of his father, he possessed Anjou, Touraine, and Maine; in that of his mother, Normandy; in that of his wife, Guienne, Poictou, Xaintonge, Auvergne, Perigord, Angoumois, and the Limousin. Soon after, he annexed Brittany to his other states, by marrying his son, who was yet a child, to the heiress of Brittany, who was a child

also, and was already in possession of the superiority over that province. These territories composed above a third of the French monarchy, and were by far the most opulent part of it; so that Henry, though vassal to the king of France, was greatly superior to him in power; and when England was added to all these, the French king had great reason to apprehend some disaster to himself and family. The king of England, however, resided at too great a distance to be able to employ this formidable power with success against the French monarch. He soon became a kind of stranger in his continental dominions; and his subjects there considered their allegiance as more naturally due to their superior lord, who lived in their neighbourhood, and who was acknowledged to be the supreme head of their nation. Their immediate lord was often at too great a distance to protect them; and a commotion in any part of Henry's extensive dominions gave great advantages against him. The wise and vigorous administration of Henry, however, counterbalanced in a great measure these disadvantages; and he maintained a surprising tranquillity throughout his extensive dominions during the greatest part of his reign.

Henry found no great difficulty in circumscribing the power of the barons; but when he attempted to do the same thing with the clergy, he met with the most violent opposition. That body had carried their independence on the civil power so far, that now they seemed to aim at nothing less than a liberty to commit all manner of crimes with impunity. During the reign of Stephen, they had extorted an immunity from all but ecclesiastical penalties*; and that grant they were resolved to maintain for the future. It may easily be supposed, that a law which thus screened their wickedness, contributed to increase it; and we accordingly find upon record, not less than 100 murders committed by men in holy orders, in the short period since the king's accession, not one of which was punished even with degradation, while the bishops themselves seemed to glory in this horrid indulgence. The king did not make any attempts against them during the life of Theobald archbishop of Canterbury, who was a man of a mild character, and besides had great merit; because, during the former reign, he had refused to put the crown on the head of Eustace, Stephen's son. He died in 1162; and the king, after his death, advanced to the see of Canterbury Thomas à Becket, his chancellor, on whose compliance he thought he might entirely depend.

The new archbishop was the first man of English pedigree, who, since the Norman conquest, had risen to any considerable station. Before his instalment in the see of Canterbury, Becket had been exceedingly complaisant, good-humoured, and agreeable to his master; and had also been accustomed to live very freely. But no sooner was he invested with this high dignity, than he totally altered his conduct, and put on all those airs of affected and ostentatious humility which could recommend him to the superstitious and ignorant multitude in that age. The first step taken by this hypocrite after his advancement, was to resign the office of chancellor. This he did without consulting the king: the reason he gave was, that henceforth he must detach himself from secular affairs, and be solely employed in the duties of his sacred function;

but in reality, that he might break off all connection with Henry. As he knew that the king intended to abridge the ecclesiastical power, he thought the best method would be to become himself the aggressor. He therefore summoned the earl of Clare to surrender the barony of Tunbridge; which, ever since the Conquest, had remained in the family of that nobleman; but which, as it had formerly belonged to the see of Canterbury, the primate pretended that his predecessors were prohibited by the canons from alienating.— William de Eynsford, a military tenant of the crown, was patron of a living which belonged to a manor that held of the archbishop of Canterbury; and Becket, without regard to William's right, presented, on a new and illegal pretence, one Laurence to that living, who was violently expelled by Eynsford. Upon this Eynsford was excommunicated. He complained to the king, that he, who held *in capite* of the crown, should, contrary to the practice established by the Conqueror and maintained ever since by his successors, be subjected to that terrible sentence, without the previous consent of the sovereign. Henry, by a messenger, commanded Becket to absolve Eynsford. The haughty primate answered, that it belonged not to the king to inform him whom he should absolve, and whom excommunicate; but, after all, he was obliged to comply with the king's orders, though with the worst grace imaginable.

As Henry perceived that the crown was now in danger, through the superstition of the people, of falling totally under the power of the clergy, he resolved to exert himself to the utmost against their scandalous usurpations. Among their other inventions to obtain money, they had now inculcated the necessity of penance as an atonement for sin; and having again introduced the practice of paying them large sums as an equivalent for these penances, the sins of the people had thus become a revenue to the priests; and the king computed, that, by this invention alone, they levied more money from his subjects than what flowed by all the funds and taxes into the royal exchequer. To ease the people of so heavy and arbitrary an imposition, the king required, that a civil officer of his appointment should be present in all ecclesiastical courts, and should for the future give his consent to every composition made for spiritual offences. About this time also the king had an opportunity of proceeding against the clergy on another footing. A clerk in Worcester-shire, having debauched a gentleman's daughter, murdered her father. The king required that the clerk should be delivered up to the magistrate. Becket pleaded the privileges of the church; confined the criminal in the bishop's prison, lest he should be seized by the king's officers; and maintained that no greater punishment could be inflicted on him than degradation. The king then required, that, immediately after he was degraded, he should be tried by the civil powers; but the primate asserted, that it was iniquitous to try a man twice upon the same accusation, and for the same crime. Upon this, Henry summoned an assembly of all the prelates in England; and put to them this decisive question, Whether or not they were willing to submit to the ancient laws and customs of the kingdom? The bishops unanimously replied, that they were willing, *saving their own order*. The king was provoked

* See (Benefit of) Clergy. 116 Monstrous wickedness of the clergy.

117 Contests of the king with Thomas à Becket.

England. provoked to the last degree at this equivocal answer. He left the assembly with evident marks of displeasure; and required the primate instantly to surrender the castles of Eye and Berkham. The other prelates were terrified; but Becket continued inflexible: however, he was at last prevailed upon, by the interposition of Philip the pope's legate and almoner, to retract the saving clause, and promise without any reserve to observe the ancient customs.

The king was not now to be satisfied with general promises from the clergy: he was determined that the ancient laws and customs should be defined, as well as the privileges of the clergy. He therefore summoned another great council of the clergy and nobility at Clarendon, to whom he submitted this important affair. A number of regulations was there drawn up, which were afterwards well known by the title of the *Constitutions of Clarendon*. By these it was enacted, that clergymen accused of any crime should be tried in the civil courts; that laymen should not be tried in spiritual courts, except by legal and reputable witnesses; that the king should ultimately judge in ecclesiastical and spiritual appeals; that the archbishops and bishops should be regarded as barons, and obliged to contribute to the public expences like other persons of their rank; that the goods forfeited to the king should not be protected in churches or church-yards by the clergy; and that the sons of villeins should not take orders without the consent of their lord. These, with some others of less consequence, to the number of 16, were subscribed by all the bishops present, and even by Becket himself; who, however, at first, showed some reluctance.

Nothing now remained but to get the constitutions ratified by the pope; but in this the king was disappointed. The pope rejected them with the utmost indignation; and, out of 16, admitted only six, which he thought were not important enough to deserve censure.—Becket was now mortified to the highest degree. He retracted his consent to the constitutions, redoubled his austerities, and even refused to execute any part of his sacerdotal function till he had obtained absolution from his holiness. Henry, considering these humiliations as insults offered to himself, desired the pope to send him a legate. He did so; but annexed a clause to his commission, by which he was prohibited from acting against the archbishop of Canterbury. The king sent back the commission to the pope; and being now exasperated beyond all patience, commenced furious prosecutions against Becket. He first sued him for some lands belonging to his primacy; and Becket being detained by sickness from coming into court, his non-attendance was construed into disrespect. The primate afterwards defended his cause in person; but all his goods and chattels were confiscated, and the bishop of Winchester was obliged to pronounce the sentence. Another suit was commenced against him for 300l. which he had levied on the honours of Eye and Berkham, and the primate agreed to give securities for the payment of the sum. The next day a third suit was commenced against him for 1000 marks, which the king had lent him upon some former occasion: and immediately following these, a still greater demand was made; namely, that Becket should give an account of the money he had received and

England. expended during the time he was chancellor. The money was computed at no less than 40,000 marks; and the primate, unable either to give an account, or find securities, took the following extraordinary method of evading the king's designs. He arrayed himself in his episcopal vestments; and with the cross in his hand, went forward to the palace. Having entered the royal apartments, he sat down, holding up the cross as his banner and protection. The king, who sat in an inner apartment, ordered by proclamation all the prelates and nobility to attend him; to whom he loudly complained of Becket's insolence. The whole council joined in condemning this instance of his unaccountable pride; and determined to expostulate with him about his inconsistency concerning the constitutions of Clarendon. But all their messages, threats, and arguments, were in vain. Becket put himself, in the most solemn manner, under the protection of the supreme pontiff, and appealed to him against any penalty which his iniquitous judges might think proper to inflict. Then leaving the palace, he asked the king's immediate permission to quit Northampton; but being refused, he secretly withdrew in disguise, and at last found means to cross over to the continent.

118 Becket flies to the continent.
Becket was received with the greatest marks of esteem, first by the king of France (who hated Henry on account of his great power), and then by the pope, whose cause he had so strenuously defended in England. Henry at the same time sent ambassadors to the pope, who were treated with coolness and contempt, while Becket was honoured with the greatest marks of distinction. These favours bestowed upon an exile and a perjured traitor (for such had been Becket's sentence of condemnation in England), irritated the king to such a degree, that he resolved to throw off at once all dependence upon the pope. He accordingly issued out orders to his justiciaries; inhibiting, under severe penalties, all appeals to the pope or the archbishop; and forbidding any of them to receive mandates from them, or to apply to their authority. He declared it treasonable to bring over from either of them any interdiction upon the kingdom. This he made punishable in secular clergymen by the loss of their livings, and by castration; in regulars, by the amputation of their feet; and in laymen, by death. On the other hand, the pope and the archbishop did not fail to issue forth their fulminations in such a manner as to shake the very foundation of the king's authority. Becket excommunicated by name all the king's chief ministers who had been concerned in sequestrating the revenues of his see, and all who obeyed or favoured the constitutions of Clarendon. He even threatened to excommunicate the king if he did not speedily repent; and had not the pope himself been threatened every day with the machinations of an antipope, whose pretensions he was afraid the king of England might support, the sentence of excommunication would certainly have been denounced.

At first, Henry paid little regard to these fulminations; but afterwards, when he found that his authority over his subjects began to decline on that account, and that his rivals on the continent were endeavouring to disturb the tranquillity of his dominions, he began sincerely to desire a reconciliation. This the pope and Becket

England. Becket also became desirous of, because they saw that their utmost endeavours were insufficient to draw Henry's subjects into a revolt against him. The treaty of accommodation, however, was often broken off, through the extreme jealousy of each of the parties; but at length, by the mediation of the pope's legate, all differences were adjusted, and Becket was reinstated in the see of Canterbury.

119
Is restored,
and behaves
with his
former in-
solence.

On the recovery of his dignity, the primate behaved with all his usual arrogance. Instead of retiring quietly to his diocese when he landed in England, he made a progress through Kent with all the splendor and magnificence of a sovereign pontiff. As he approached Southwark, the clergy, the laity, and all ranks of people, come forth to meet him, and celebrated his triumphal entry with hymns of joy. Being thus confident of the support of the people, he resolved to make his enemies feel the severest effects of his vengeance. He suspended the archbishop of York, who had crowned Henry's eldest son in his absence. He excommunicated the bishops of London and Salisbury, with some of the principal nobility and prelates who had assisted at the coronation. One man he excommunicated for having spoken against him, and another for having cut off the tail of one of his horses. The excommunicated and degraded prelates immediately made their complaints to the king; and he having dropped some passionate expressions, intimating a desire to have Becket's life taken away, the supposed will of the king was instantly accomplished; nor could the king's express orders to the contrary arrive time enough to hinder the execution of this fatal purpose. See BECKET.

120
Grief of the
king for his
death.

The king was thrown into the utmost consternation on hearing of Becket's murder. He knew that the primate's death would accomplish what his most violent opposition during his life could never have done, and therefore he gave himself up to sorrow: for three days he even refused all nourishment; till at last his courtiers were obliged to break in upon his solitude, and induce him to acquiesce in an event which could not possibly be recalled. The pope was with some difficulty made sensible of the king's innocence; but refused to grant him a pardon, except on condition that he should make every future submission and perform every injunction the holy see thought proper to demand. When things were thus adjusted, the assassins who had murdered Becket were allowed to retire in safety to the enjoyment of their former dignities; and the king, with a view to divert the minds of the people to a different object, undertook an expedition into Ireland, and totally reduced that island. See IRELAND.

121
Diffensions
in Henry's
family.

The king was scarcely freed from the war with Ireland, and the dangerous controversy in which he had engaged with the church of Rome, when he found himself involved in the most unnatural contests with his children, to whom he had always behaved in the most tender and affectionate manner. He had ordered Henry his eldest son to be anointed king; and had destined him for his successor in the kingdom of England, the duchy of Normandy, and the counties of Anjou, Maine, and Touraine; territories which lay contiguous, and which might thus easily lend their assistance to one another. Richard his second son

was invested in the duchy of Guienne and county of Poitou: Geoffrey, his third son, inherited, in right of his wife, the duchy of Brittany: and the new conquest of Ireland was destined for the appendage of John his fourth son, for whom he had negotiated a marriage with Adalais the only daughter of Humbert count of Savoy and Maurienne; and with whom he was to receive as a dowry very considerable demesnes in Piedmont, Savoy, Bresse, and Dauphiny. This greatness of Henry's family alarmed the king of France; and he therefore excited young Prince Henry to demand of his father, either the immediate resignation of the crown of England, or the duchy of Normandy. The king refused to comply with such an extravagant demand; upon which the prince made his escape to Paris, where he was protected by the French king. This happened in 1173; and the same year, Queen Eleanor, finding that she was now grown very disagreeable to the king, communicated her discontent to her two younger children Geoffrey and Richard, whom she engaged also to demand the territories assigned them, and then fly to the court of France. The queen herself was meditating an escape to the same court, and had put on man's apparel for that purpose, when she was seized and confined by Henry's order. The licentious barons in the mean time wished for a change of government; hoping to have liberty, under young and inexperienced princes, to commit those rapines and violences which they could not do with safety when governed by such a prudent and vigilant king as Henry. In the midst of this universal defection, however, the English monarch still retained his usual intrepidity, and prepared with as much vigour as possible for the contest. As he could depend on the fidelity of very few of his nobility, he was obliged to enlist in his service a number of desperate ruffians called *Brabanzons*, and sometimes *Routiers* or *Cottreaux*, though for what reason is not mentioned in history. These banditti were very numerous during the times of the feudal government, when many private wars were carried on between the nobles; and 20,000 of these, with a few forces furnished by his faithful barons, composed the whole of Henry's army on this occasion.

122
Queen E-
leanor con-
fined.

With this force the king of England totally overthrew the schemes of his enemies on the continent; but being very desirous of putting an end to the war, he this very year (1173) agreed to a conference with the king of France. At this interview, Henry offered his children the most advantageous terms. He insisted only on retaining the sovereign authority in all his dominions. To Henry he offered half the revenues of the crown of England, with some places of surety in that kingdom; or if he chose rather to reside in Normandy, half the revenues of that duchy, with all those of Anjou. He made a like offer to Richard in Guienne; he promised to resign all Brittany to Geoffrey; and if these concessions were not deemed sufficient, he agreed to add to them whatever the pope's legates, who were present, should require of him. The conference, however, was broken off by the violence of the earl of Leicester; who not only reproached Henry in the most indecent manner, but even put his hand to his sword, as if he intended to attempt some violence against him.

In

England.

In the mean time, the most of the English nobility united in opposition against their sovereign; and an irruption at this time by the king of Scotland assisted their rebellious schemes. The earl of Leicester soon after invaded Suffolk at the head of a body of Flemings; but they were repulsed with great slaughter and the earl himself was taken prisoner. Soon after, William king of Scotland, who had been repulsed, and agreed to a cessation of arms, broke the truce, and invaded England with an army of 80,000 men, committing the most terrible devastations. Henry in the mean time, to reconcile himself thoroughly to the church, performed the penances at the tomb of Thomas à Becket which he had formerly promised to do. As soon as he came within sight of the church of Canterbury, he alighted from his horse, walked barefoot towards the town, and prostrated himself before the shrine of the saint. He remained a whole day in prayer and fasting, watched the holy relics all night, made a grant of 50l. a-year to the convent for a constant supply of tapers to illuminate the shrine; and not satisfied with these submissions, he assembled a chapter of monks, disrobed himself before them, put a scourge into each of their hands, and presented his bare shoulders to their strokes. Next day he received absolution; and, departing for London, had the agreeable news of the defeat and captivity of William king of Scotland, which happened on the very day of his absolution.

123
King of
Scotland
defeated
and taken
prisoner.

This victory proved decisive in Henry's favour. The English barons who had revolted, or were preparing for a revolt, instantly delivered up their castles to the victor, and the kingdom was in a few weeks restored to perfect tranquillity. Prince Henry, who was ready to embark with a great army to join the English rebels, abandoned all thoughts of the enterprise. Soon after a treaty was concluded with the king of France; in which Henry granted his children much less advantageous terms than he had offered them before. The principal were, some pensions for their support, castles for their residence, and an indemnity to all their adherents. The greatest sufferer by this war was William king of Scotland. He was compelled to sign a treaty, by which he obliged himself to do homage to Henry for the kingdom of Scotland. It was agreed, that his barons and bishops should do the same; and that the fortresses of Edinburgh, Stirling, Berwick, Roxburgh, and Jedburgh, should be delivered into the hands of the conqueror till the articles were performed. This treaty was executed most punctually and rigorously on the 10th of August 1175. The king, barons, and prelates of Scotland, did homage to Henry in the cathedral of York; the greatest humiliation to which the Scottish nation had ever been subjected.

124
Owns him-
self Henry's
vassal.

125
New dissen-
sions in
Henry's fa-
mily.

Henry was now freed from all troubles, either at home or abroad, for five years; during which time he made several salutary laws for the good of his kingdom. But, in 1180, the ambitious spirits of his children involved him in fresh calamities. Richard, who had been invested by his father with the sovereignty of Guienne, refused to do homage to his elder brother, as King Henry had required him to do. Young Henry and Geoffrey, uniting their arms, invaded their brother's dominions; and while the king was endeavour-

England.

ing to compose their differences, he found himself conspired against by them all. The conspiracy, however, was defeated by the death of Prince Henry in 1183. He had retired to Martel, a castle near Turenne, where he was seized with a fever; and perceiving the approaches of death, he was at last struck with remorse for his undutiful behaviour towards his father. He sent a messenger to the king, who was not far distant; expressed his contrition for his faults; and intreated the favour of a visit, that he might at least die with the satisfaction of having received his forgiveness. The king, who had so often experienced his son's ingratitude and violence, apprehended that his sickness was entirely a feint, and dared not trust himself in the prince's hands. But soon after, receiving certain intelligence of his death, and proofs of his sincere repentance, the good old king was affected with the deepest sorrow. He thrice fainted away; he accused his own hard-heartedness in refusing the dying request of his son; and he lamented that he had deprived the prince of the last opportunity of making atonement for his offences.

Prince Henry, who died in the 28th year of his age, left no posterity. His brother Richard succeeded to his dominions, and soon discovered as turbulent a spirit as that which had actuated his brother. He refused to give up Guienne, which Henry had designed for his fourth son John; and even made preparations for carrying on war against his father, and brother Geoffrey. Henry sent for Eleanor his queen, the heiress of Guienne; to whom Richard, either dreading an insurrection in her favour, or out of a sense of duty, willingly yielded up the territory, and retired peaceably to his father's court. This breach, however, was no sooner made up, than Geoffrey demanded Anjou to be added to his dominions in Brittany. This the king refused; upon which he fled to the court of France, and prepared to levy an army against his father. Henry, however, was freed from the danger which threatened him from that quarter, by his son's death, who was killed in a tournament at Paris. The loss of this prince gave few, except the king himself, any uneasiness; for he was universally hated, and went among the people by the name of the *Child of Perdition*. The widow of Geoffrey, soon after his decease, was delivered of a son, who received the name of *Arthur*, and was invested in the duchy of Brittany, under the guardianship of his grandfather, who, as duke of Normandy, was also superior lord of that territory. Philip, as lord paramount, disputed for some time his title to this wardship; but was obliged to yield to the inclinations of the Bretons, who preferred the government of Henry. Some other causes inflamed the dissension between these two monarchs, and Philip once more seduced Richard from his duty. He insisted, that his marriage with Adalais, Philip's sister, should be immediately completed, and threatened to enforce his pretensions with a formidable army. This occasioned another conference between Gisors and Trie, the usual place of meeting, under a vast elm that is said to have shaded more than an acre. In the midst of this conference the archbishop of Tyre appeared before the assembly in the most miserable habit, and begged assistance against the infidels, who, under Saladin, had almost totally expelled the Christians from Asia. His intelligence

England. gence appeared so very dismal, that the kings of France and England laid aside their animosity. Both of them immediately took the cross; but Richard, who had long wished to have all the glory of such an expedition to himself, could not bear to have even his father for a partner in his victories. He therefore entered into a confederacy with the king of France; so that Henry found himself at last obliged to give up all thoughts of the crusade, in order to defend himself against this unnatural combination. The event of the war proved very unfortunate for Henry, who lost several towns, and narrowly escaped falling into the hands of the enemy himself. At last a treaty was concluded at the intercession of the duke of Burgundy, the count of Flanders, and the archbishop of Rheims; but upon terms very humiliating to the king of England. It was agreed that Richard should marry the princess Adalais, and be crowned king of England during the lifetime of his father; that Henry, should pay 20,000 marks to the king of France, as a compensation for the charges of the war; that his own barons should engage to make him observe this treaty, and in case of violating it, to join Philip and Richard against him; and that all his vassals who had espoused the cause of Richard should receive an indemnity for their offence. These terms, mortifying as they were, Henry bore with patience; but when, upon receiving a list of the barons that were to be pardoned, he found his own son John, who was his favourite, among them, he could no longer support his grief. He broke out into the most lamentable expressions of despair; cursed the day in which he received his miserable being; and bestowed on his ungrateful children a malediction which he could never afterwards be prevailed upon to retract. Soon after, he fell into a lingering fever occasioned by his grief; and of this he died on the 6th of July 1189, in the 58th year of his age and 35th of his reign. His natural son Geoffrey, who alone had behaved dutifully towards him, attended his corpse to the nunnery of Fontevault, where it lay in state in the abbey-church. Next day Richard, who came to visit the dead body of his father, was struck with horror at the sight. At his approach, the blood was seen to gush out at the mouth and nostrils of the corpse; and this accident was, by the superstition of the times, interpreted as the most dreadful rebuke. Richard could not endure the sight. He exclaimed that he was his father's murderer; and expressed a strong, though too late, sense of his undutiful conduct.

126
His extreme grief and death.

127
Richard I.

Richard succeeded to the throne without opposition immediately after his father's death; and, on his accession, set his mother Eleanor (who had been again confined) at liberty. A romantic desire for strange adventures, and an immoderate zeal for the external rites of religion, were the ruling passions of the times. By the first of these Richard was inflamed to the highest degree, and therefore behaved as if the whole design of his government had been to attempt the recovery of the Holy Land from the Infidels. The superstition of the people showed itself in a most violent and tragical manner on the very day of the king's coronation. The Jews were the objects of universal hatred, so that Richard had issued out orders forbidding any of them from appearing at his coronation. But some of them bringing him large presents from

128
Massacre of the Jews.

their nation, presumed, notwithstanding these orders, to approach the hall in which the king dined. Being discovered, they were exposed to the insults and injuries of the bystanders; in consequence of which they fled, and were pursued by the people. A report was spread, that the king had given orders to massacre all the Jews. This supposed command was executed in the most cruel manner. Multitudes were slaughtered in the city of London; and this example was followed in most of the cities in England. Five hundred Jews had retired into York castle for safety: but finding themselves unable to defend the place, they murdered their wives and children; threw the dead bodies over the wall against their enemies who attempted to scale it; and then, setting fire to the houses, perished in the flames. The gentry in the neighbourhood, who were all indebted to the Jews, ran to the cathedral where their bonds were kept, and made a solemn bonfire of them before the altar.

Richard immediately began to take measures for his expedition into Palestine. His father had left him 100,000 marks; and this sum he augmented by all expedients he could think of, however pernicious to the public, or dangerous to the royal authority. He set up to sale the revenues and manors of the crown, and several offices of the greatest trust and power. Liberties, charters, castles, were given to the best bidders. His friends warned him of the danger attending this venality; but he told them he would sell the city of London itself, if he could find a purchaser. Numerous exactions were also practised upon all ranks and stations; menaces, promises, and expostulations, were used to fright the timid, and allure the avaricious. A zealous preacher of those times was emboldened to remonstrate against the king's conduct; and advised him to part with his three daughters, which were pride, avarice, and sensuality. To this Richard readily replied, "You counsel right, my friend; and I have already provided husbands for them all. I will dispose of my pride to the templars; my avarice to the monks; and as for my sensuality, the clergy shall share that among them." At length the king having got together a sufficient supply for his undertaking, and even sold his superiority over Scotland for a moderate sum, set out for the Holy Land; whither he was impelled by repeated messages from the king of France, who was ready to embark in the same enterprise.

129
Richard's preparations for his journey into Palestine.

An account of Richard's exploits in this expedition is given under the articles EGYPT, SICILY, CYPRUS, &c.—Having at last concluded a truce with Saladin, he set out on his return for England. He was, however, at a loss how to proceed. He durst not return by the way he came, as this would put him in the power of the king of France, between whom and the king of England an irreconcilable enmity had taken place. No way therefore was left but by going more to the north; for which reason he took shipping for Italy, but was wrecked near Aquileia. From thence he travelled towards Ragusa, and resolved to make his way through Germany in the habit of a pilgrim. But his expences and liberalities having betrayed him, notwithstanding this disguise, he was arrested by Leopold duke of Austria, who commanded him to be loaded with shackles. This prince had served under Richard

130
Taken prisoner on his return.

England. at the siege of Acre (the ancient Ptolemais), where having received some disgust, he took this base method of revenging himself. Henry VI. emperor of Germany, was then equally an enemy to Richard on account of his having married Berengaria the daughter of Tancred king of Sicily. He therefore required the royal captive to be delivered up to him, and stipulated a large sum of money to the duke as a reward for his service.

The kingdom of England in the mean time was in great confusion. Richard had left it under the direction of Hugh bishop of Durham, and Longchamp bishop of Ely. The tempers of these prelates being very different, an animosity between them soon took place. Longchamp at last arrested his colleague, and obliged him to resign his power in order to obtain his liberty. The king, by many letters, commanded Longchamp to replace his coadjutor, but to no purpose. When the situation of the king became uncertain, Longchamp tyrannized to such a degree, that John the king's brother thought proper to oppose him. He then left the kingdom; and upon this the archbishop of Rouen was made judiciary in his room. The king of France being informed of these dissensions, strove to increase them as much as possible; and had even almost prevailed upon John to throw off his allegiance, by promising to put him in possession of all Richard's continental dominions.

131
Treachery
of John the
king's brother.

When the English first received the news of Richard's captivity, a general indignation was excited through the whole nation. The greatest, and almost the only traitor in the kingdom, was the king's own brother John. On the very first invitation from the court of France, he went abroad, and held a consultation with Philip, the object of which was the perpetual ruin and captivity of his unhappy brother. He promised to deliver into Philip's hands a great part of Normandy; and, in return, he received the investiture of all Richard's transmarine dominions: it is even said, that he did homage to the French king for the crown of England.

In consequence of this treaty, Philip invaded Normandy, and made considerable progress in the conquest of it. He was, however, at last repulsed by the earl of Leicester, who was now returned from the Holy Land; and a truce was concluded, on condition of paying the French king 20,000 merks, and putting four castles into his hands by way of security for the payment.—John, who had come over to England, met with still less success in his enterprises. He was only able to make himself master of the castles of Windsor and Wallingford; but when he came to London, and demanded the kingdom as heir to this brother, of whose death he pretended to have received certain intelligence, he was rejected by all the barons, and measures were taken to oppose and subdue him. The defence of the kingdom was so well provided for, that John after some fruitless efforts, was obliged to conclude a truce with his opponents; and, before the expiration of it, he thought proper to retire to France, where he openly acknowledged his alliance with Philip.

All the efforts of Richard's enemies proved ineffectual to detain him in captivity. He was brought before the diet of the empire at Worms, where the emperor Henry brought against him a charge of many

crimes and misdemeanours: but to this the king replied with so much spirit and eloquence, that the German princes exclaimed loudly against the conduct of the emperor; the pope threatened him with excommunication; and Henry, who had hearkened to the proposals of the king of France and Prince John, found that it would be impossible for him to execute his and their base purposes, and detain the king of England any longer in captivity. He therefore concluded a treaty with him for his ransom; and agreed to restore him to his liberty for 150,000 merks, about 100,000*l.* of our money, of which 100,000 merks were to be paid immediately, and 67 hostages delivered for the remainder.

England.

The money for the king's ransom was most cheerfully raised by the English. The churches and monasteries melted down their plate to the amount of 30,000 merks; the bishops, abbots, and monks, paid a fourth part of their yearly rent; the parochial clergy contributed a tenth part of their tithes; and the requisite sum being thus collected, Queen Eleanor and Walter archbishop of Rouen set out with it for Germany, paid the money to the emperor and duke of Austria at Mentz, delivered them hostages for the remainder, and freed Richard from his captivity. His escape was very critical. Henry had been detected in the assassination of the bishop of Liege, and in an attempt of the like nature on the duke of Louvaine; and finding himself extremely obnoxious to the German princes on account of these odious practices, he had determined to seek support from an alliance with the French king, and to detain Richard in perpetual captivity, notwithstanding the sum he had already received for his ransom. He therefore gave orders that Richard should be pursued and arrested; but the king making all imaginable haste, had already embarked at the mouth of the Scheldt, and was out of sight of land when the emperor's messengers reached Antwerp. The king of France no sooner heard of Richard's deliverance, than he wrote to John his confederate in these terms: "Take care of yourself: the devil is broke loose."

132
Richard re-
leased from
captivity.

The king of England returned from captivity on the 20th of March 1194, and was received with the utmost joy by his subjects. He had been but one day landed, when his treacherous brother John came to make his submission. At the intercession of Queen Eleanor he was received into favour. "I forgive him (said the king), and hope I shall as easily forget his offences as he will my pardon." Richard was impatient to revenge himself on the king of France, and therefore instantly made war upon him. But though both kings were inflamed with the most violent resentment against each other, they found it impossible to engage their powerful barons heartily in their cause. The war, therefore, produced no remarkable event; and, in 1195, was concluded by a truce for five years. On some slight occasion it was ready to break out anew, when the pope's legate interposed, and a treaty was about to be concluded. King Richard in the mean time was wounded by an arrow at the siege of Chalus, a castle of Limoges. The wound was not itself dangerous; but being unskilfully treated, a mortification ensued, and the king expired on the 6th of April 1199, in the 10th year of his reign and 42d of

133
Returns to
England.

134
His death.

England. his age. By his will he left the kingdom to his brother John, but distributed a fourth part of his treasure among his servants.

135
John succeeds to the crown.

John succeeded to the crown of England without opposition, but soon found his affairs embarrassed on the continent. The king of France, who, during the life of King Richard, had always supported the pretensions of John, now gave a like support to the claims of Prince Arthur the son of Geoffrey, who, though only 12 years of age, promised to be deserving of the kingdom. But in this matter the king of France showed so much regard to his own interest, that Constantia, the mother of the young prince, thinking that her ally designed to keep for himself the provinces which he pretended to conquer for Arthur, submitted herself and her son to John, who detained them in Mans; and thus became undisputed master of the whole empire.

136
His bad qualities.

The new king was weak, tyrannical, cruel, and treacherous. In short, he seemed to be endowed with almost every bad quality that can fall to the share of man. His conduct, therefore, soon rendered him universally odious. Imagining himself now secure on the side of France, he indulged his passion for Isabella, the daughter and heiress of the count of Angouleme, with whom he was much enamoured. His queen, the heiress of the family of Gloucester, was still alive; and Isabella was married to the count de la Marche, though, by reason of her youth, the marriage had not been consummated. John persuaded the count de Angouleme to carry off his daughter from her husband; at the same time that he procured, under some pretence or other, a divorce from the queen. Thus he incurred the displeasure of the pope, and also of the count de la Marche, and a powerful confederacy was formed against him.

As John had neither courage nor policy sufficient to keep his barons in awe, he took a method for that purpose equally base and cruel. This was by hiring a set of ruffians, whom he called his *champions*, to fight duels with them, in cases where they required to clear themselves from any charge by fighting a duel, according to the custom of those times. Thus he proposed to get rid of his refractory barons; but they, despising opponents who were so far below their rank, refused to fight with them, and a dangerous combination was formed among the barons against him.

137
Murders his nephew.

The murder of Prince Arthur rendered John still more generally detested. The young prince with his mother had fled to the court of France, where they were received with the greatest kindness, and found their interests more vigorously supported than before. Their enterprises were attended with considerable success, when Arthur himself had the misfortune to be taken prisoner. All the other captives were sent to England; but the prince was shut up in the castle of Falaise, and from that time was never heard of. It was universally believed that John had murdered him with his own hand; and this inflamed the general resentment against him to such a degree, that he soon after lost all his French provinces. In 1205, the duchy of Normandy itself was also conquered by Philip, and John was forced to fly with disgrace to England.

The king was resolved to wreak his vengeance upon the barons, who, he pretended, had deserted his stand-

ard in Normandy. For this reason, he levied large sums on their estates; in order, as he said, to undertake an expedition to the continent. This expedition, however, he several times capriciously deferred; and once having ventured out to sea, returned again without making the smallest attempt. At last, he landed at Rochelle, and burnt the city of Angiers; but hearing that the enemy were preparing to oppose him, he returned without attempting any thing else.

This irresolute and cowardly behaviour of John made him contemptible in the eyes of his subjects; but the Norman princes had so far extended the prerogatives of the English crown, that the barons, however discontented, durst not yet attempt to change the form of government. John, by entering into a controversy with the church, completed his ruin. The clergy, who for some time had acted as a community totally independent of the civil power, had their elections of each other generally confirmed by the pope, to whom alone they owned subjection. The election of archbishops, however, had been a subject of continual dispute between the suffragan bishops and the Augustine monks. In the mean time the archbishop of Canterbury died; and the Augustine monks, in a very private manner, elected Reginald, their superior, in his place. The bishops exclaimed against this election, as a manifest innovation of their privileges; and a furious theological contest was likely to ensue. John very imprudently took a side in this controversy, and espoused the cause of the suffragan bishops; in consequence of which, John de Grey bishop of Norwich was chosen. The cause was appealed to Rome; and Pope Innocent III. seizing with avidity an opportunity of extending his power, commanded the monks to choose Cardinal Stephen Langton, an Englishman, then at the court of Rome. The power of nominating an archbishop of Canterbury (a person of almost equal authority with the king), was an acquisition that would effectually give the court of Rome an unlimited authority over England. John therefore was resolved not to submit to this imposition; but he had not judgment sufficient to conduct him. He violently expelled the monks from their convent, and seized upon their revenues. The pope perceiving, from this absurd conduct, that John was unequal to the task he had undertaken, after some intreaties, threatened to put the whole kingdom under an interdict. The prelates threw themselves on their knees before the king, and in the most earnest manner intreated him to avoid the resentment of the holy tribunal, by receiving the primate, and restoring the monks to their convent. John, however, broke out into the most violent invectives. He swore by *God's teeth* (his usual oath), that if the kingdom was put under an interdict, he would banish the whole body of the clergy, and confiscate all their possessions. The pope at last, finding he might do it with safety, issued forth this terrible sentence, so much dreaded by the whole nation. A stop was immediately put to divine service, and the administration of all the sacraments except baptism. The church-doors were shut, and the images of the saints laid on the ground. The dead were refused Christian burial; and were thrown into ditches and on the highways, without any funeral solemnity. Marriage was celebrated in the churchyards, and the people prohibited the use of meat as

138
His contest with the pope.
139
The king and domain laid under an interdict.

England.

in times of public penance. They were debarred from all pleasure; even from shaving their beards, saluting each other, or paying any regard to their apparel. The clergy deplored the unhappy state of the nation in the most lamentable manner; while John, in revenge, imprisoned all their concubines, and treated the adherents of Langton with the utmost rigour.

140
The king excommunicated, and the kingdom given to Philip of France.

The furious and imprudent efforts of John proved totally ineffectual. He had scarce a friend left in the whole nation; and therefore, in 1209, the pope denounced a sentence of excommunication against him. This was soon followed by another still more terrible; namely, the absolving all the subjects of the king of England from their allegiance, and declaring every one to be excommunicated who had any commerce with him at his table, council, or even in private conversation. The king, rendered quite furious by these repeated indignities, wreaked his vengeance on his unhappy subjects, whose affections he ought rather to have attempted to conciliate. The pope, therefore, proceeded to execute the full measure of his wrath on this devoted prince, by giving away his kingdom to Philip of France. He published a crusade all over Europe against King John; exhorting the nobility, the knights and men of every condition, to take up arms against him, and enlist under the French banner. Philip was not less active on his part. He summoned all the vassals of the crown to attend him at Rouen; and having collected a fleet of 1700 vessels, was ready, in 1213, to invade England.

The pope had now overstretched his power; and had the English nation been governed by a prince of any degree of prudence or resolution, the power of the clergy would in all probability have been totally broken. The people, however superstitious and ready to obey in matters of religion, could not tamely submit to be given away by the pope as slaves from one master to another; and therefore this consideration, added to the natural antipathy subsisting between the French and English, put John, notwithstanding all his offences, at the head of an army of 60,000 men. But the pope was too great a politician to suffer matters to be carried to extremities. He promised himself many more advantages from the submission of John than from an alliance with Philip; and therefore came over in person, or, according to some, sent over his legate, to England, under pretence of conferring with the barons, but in reality to hold a conference with John. He there represented to this forlorn prince, the numbers of the enemy, the hatred of his own subjects, and the secret confederacy there was against him in England. He intimated, that there was but one way to secure him from the impending danger; namely, to put himself under the protection of the pope, who was a merciful father, and still willing to receive a repenting sinner. The abject and irresolute spirit of John submitted to this last piece of arrogance, and he took an oath to obey whatever the pope should command. In consequence of this oath, he took another, the most extraordinary mentioned in the records of history; and which, as it was taken while he commanded an army of 60,000 men, discovers a meanness of spirit almost incredible. The terms imposed by it were expressed in the following words. "I John, by the grace of God king of England and lord of Ireland, in order to

141
John's submission to the pope.

expiate my sins, from my own free will, and the advice of my barons, give to the church of Rome, to Pope Innocent and his successors, the kingdom of England, and all other prerogatives of my crown. I will hereafter hold them as the pope's vassal. I will be faithful to God, to the church of Rome, to the pope *my master*, and his successors legitimately elected. I promise to pay him a tribute of 1000 merks; to wit, 700 for the kingdom of England, and 300 for the kingdom of Ireland."

England

This oath was taken by the king before all the people, kneeling, and with his hands held up between those of the legate. Having then agreed to reinstate Langton in the primacy, he received the crown which he had been supposed to have forfeited; while the legate, to add to his former insolence, trampled under his feet the tribute which John had consented to pay.—The king of France was enraged at this behaviour of the pope; and resolved to execute his project of conquering England, in spite of him and all his censures. His fleet, however, was attacked in their harbours by the English, who took 300 vessels, and destroyed about 100 more; while Philip, finding it impossible to prevent the rest from falling into the hands of the enemy, set fire to them himself, and thus was obliged to give up all hopes of success.

John being thus freed from all danger, continued to follow the same cruel and tyrannical measures which had hitherto rendered him odious to his subjects. His scandalous subjection to the clergy now gave the barons an opportunity of exerting themselves, in order to reduce the enormous prerogatives of the crown. Their designs were greatly facilitated by the concurrence of Langton the primate, who on all occasions showed a sincere regard for the interests of the kingdom. At a synod of his prelates and clergy, convened in St Paul's, on pretence of examining into the losses of some bishops who had been exiled by John, he privately conferred with a number of barons, to whom he expatiated upon the vices and injustice of their sovereign. He showed them a copy of Henry the first's charter; (being the only one in the kingdom, and which had been buried in the rubbish of an obscure monastery). Langton exhorted the barons to insist on a renewal of it; and this they solemnly swore to perform. The same agreement was afterwards renewed at a more numerous meeting of barons summoned by Langton at St Edmondsbury. Here it was resolved, that at Christmas they should prefer their common petition in a body, and in the mean time they separated with a design to put themselves in a posture of defence, enlist men, and fortify their castles. In the beginning of January 1215, they repaired to London, accoutred in their military garb and equipage, and presented their petition to the king, alleging that he had promised to grant a confirmation of the laws of Edward the Confessor, at the time he was absolved from his excommunication. John repented their presumption; and required a promise under their hands and seals, that they would never demand, or attempt to extort, such privileges for the future. This they refused with such unanimity and resolution, that the king desired time to consider of their demands. He promised, that, at the festival of Easter, he would give a positive answer to their petition; and offered them the archbishop of Canterbury, the bishop of

142

The barons attempt to reduce the prerogatives of the crown.

England. Ely, and the earl mareſchal, as ſureties for fulfilling his engagements.

The barons accepted of his ſecurities, and departed peaceably; but John had no deſign of complying with their deſires. He had recourſe to the clergy, whoſe power he had ſeen and felt in ſo many inſtances. He courted their favour, by granting them a charter eſtabliſhing all thoſe rights of which they were already in the poſſeſſion, and which he now pretended to confirm when he had not the liberty to reſuſe. To ingratiate himſelf ſtill farther with this body, he took the croſs, and appealed to the pope againſt the uſurpation of the barons. The pope wrote letters to England, reproaching the primate and biſhops with favouring theſe diſſenſions; and commanded them to promote peace between the two parties. He exhorted the barons to conciliate the king, not with menaces, but with humble intreaties; and promiſed, upon their obedience, to interpoſe his own authority in favour of ſuch of their petitions as he ſhould find to be juſt. At the ſame time, he annulled their aſſociation, and forbade them to enter into any confederacy for the future.

The barons paid no regard to the pope's remonſtrances; knowing that the fulminations of the court of Rome would be of little avail, unleſs they were ſeconded by the clergy of England. After waiting till Eaſter, when the king promiſed to return them an answer, they met by agreement at Stamford. There they aſſembled a force of above 2000 knights, and a prodigious number of foot. Thence they marched to Brackley, about 15 miles from Oxford, the place where the court then reſided. John, hearing of their approach, ſent the archbiſhop of Canterbury, the earl of Pembroke, and others of his council, to know the particulars of their requeſt, and what thoſe liberties were which they ſo much importuned him to grant. The barons delivered a ſchedule containing the chief articles of their demands, founded on the charters of Henry and Edward; but which were in the higheſt degree diſpleaſing to the king. He burſt into a furious paſſion, aſked the barons why they did not alſo demand his kingdom; and ſwore that he would never comply with ſuch exorbitant demands. The confederates then choſe Robert Fitzwalter for their general; whom they dignified with the title of "Mareſchal of the army of God and of the holy church." They laid ſiege to Northampton, took Bedford, and were joyfully received into London. They wrote letters to all the nobility and gentry who had not yet declared in their favour, threatening their eſtates with deſtroy in caſe of reſuſal or delay.

In the mean time the king was left at a place called *Odiham* in Surrey, attended only by ſeven knights. He vainly endeavoured to avert the ſtorm by the mediation of his biſhops and miniſters. He appealed to Langton againſt the barons, not ſuſpecting that he was engaged in the confederacy; and deſired him to fulminate the church cenſures againſt thoſe who had made war upon their lawful prince. Langton declared that he would paſs no cenſure where he found no delinquent; but ſaid, that much might be done if the king would diſmiſs ſome foreign auxiliaries which he had lately brought over. Upon this John diſbanded a great body of Germans and Flemings whom he had hitherto retained in his ſervice, and Langton reſuſed

to excommunicate a ſingle baron. The king, being now quite defenceleſs, was obliged at laſt to comply with the demands of his ſubjects. A conference was accordingly appointed, and all things were adjusted for this moſt important treaty.

The king's commiſſioners met the barons at a place called *Runmede*, between Staines and Windſor; and which is yet held in reverence as the ſpot where the ſtandard of freedom was firſt erected in England. Here the king ſigned the charter called *Magna Charta*: which continues in force to this day, and is ſtill regarded as the great bulwark of Britiſh liberty. See *Magna Charta*.

This charter, however, at the time that it was made, ſecured liberty to the clergy, barons, and gentlemen, much more than to the bulk of the people, who did not for a long time obtain any privileges of importance. Freedom of elections was ſecured to the clergy; and it was determined, that fines on them for any offence ſhould be laid on in proportion to their eſtates, and not the value of their benefices. The privileges ſecured to the barons were, either abatements in the rigour of the feudal laws, or relief from arbitrary and ambiguous deciſions before the courts. It was alſo decreed, that barons ſhould recover the lands of their vaſſals, even though forfeited by felony, after having been in the poſſeſſion of the crown for a year and a day; and no tax was to be impoſed without conſent of the great council of the nation, excepting in caſe of the captivity of the king, the knighting of his eldeſt ſon, or marrying his eldeſt daughter. No land belonging to any baron was to be ſeized for a crown-debt, unleſs the poſſeſſor had not perſonal property enough to pay it; neither was any vaſſal to be allowed to ſell ſo much of his land as to incapacitate him from performing the neceſſary ſervice to his lord. It was alſo determined, that when the great council of the nation was called, the prelates, earls, and barons, ſhould be ſummoned by a particular writ, and the leſſer barons ſhould receive a ſummons from the ſheriff. In favour of the people it was ſtipulated, that they ſhould have from the barons all the immunities and privileges granted by the king to the former. Merchants were to be allowed to carry on their buſineſs without any arbitrary tolls or impoſitions, and to go out of the kingdom and return at pleaſure. The goods of every freeman were to be diſpoſed of according to his will; or if he died inteſtate, the neareſt heir ſhould ſucceed him. No carts, horſes, or wood, were to be taken by the crown officers without the conſent of the owner. The king's courts were to be ſtationary, and no delay to be made in doing juſtice to every one; no freeman ſhould be taken or impriſoned, diſpoſſeſſed of his free tenement, outlawed or baniſhed, unleſs by the legal judgment of his peers, &c. It was likewiſe ſtipulated, that London ſhould remain in the hands of the barons, and the tower be conſigned to the primate, till the 15th of Auguſt following; or till the articles of the charter ſhould be fulfilled. To give the more ſecurity for this, the king allowed them to chooſe 25 of their own number, to whoſe authority no limits were ſet either in extent or duration. If any complaint were made of a violation of the charter, either by the king or his officers, any four of the barons might admoniſh the king to redreſs the grievance; and if ſatisfaction were not obtained,

England.

143
They force
him to ſign
Magna
Charta.

144
Principal
articles of
it.

^{England.} obtained, they might assemble the whole council of 25; and they, in conjunction with the great council, were empowered to compel him to fulfil the charter. In case of his resistance, they had liberty to levy war against him, attack his castles, and use every kind of violence, except against his person, or those of the queen or children. All men throughout the kingdom were bound, under the penalty of confiscation, to swear obedience to the 29 barons; and the freeholders of each county were to choose 12 knights, whose business it was to report such evil customs as ought to be redressed in terms of Magna Charta.

¹⁴⁵ The king raises an army against his barons. But although John had thus obliged himself, by writing, to allow liberty to his subjects, he had no mind that they should enjoy it in reality. The sense of his subjection to his own vassals sunk deep in his mind. He became sullen, silent, and reserved. He shunned the society of his former friends; and retired into the isle of Wight, as if to hide his disgrace in solitude; but, in reality, to meditate revenge against the barons. He sent to the continent to enlist a large body of mercenary troops, and made complaints to the pope of the insurrections of the barons against him. The pontiff very warmly espoused his cause; a bull was sent over, annulling the whole charter; and at the same time the foreign troops arriving, the king once more found himself in a condition to demand his own terms from his subjects.

¹⁴⁶ They offer the kingdom to Louis the French king's son. The barons had made no preparations for war, not suspecting the introduction of a foreign army. The king, therefore, was for some time undisputed master of the field, and the most horrid cruelties were committed by his army. The nobility who had been most active in procuring the great charter fled with their families to Scotland, where they obtained the protection of King Alexander by doing homage to him. The barons being totally unable to raise an army capable of contending with that of John, applied to their old enemy Philip of France, offering to acknowledge his eldest son Louis for their sovereign, on condition of his protecting them from the fury of John and his mercenaries. The French king accepted their proposal with joy; and twenty-five hostages which he demanded being sent over, began to make the most diligent preparations for this expedition, regardless of the menaces of the pope, who threatened him with excommunication, and actually excommunicated his son Louis some time after.

The first troops who came to the assistance of the barons, were only a body of 7000 men; but, soon after, Louis with a powerful army landed at Sandwich. The first effect of this invasion was, that most of John's foreign troops deserted, refusing to serve against the heir of their monarchy. Many considerable noblemen also deserted his cause, and Louis daily gained ground. This prince advanced to London, where the barons and burghers did him homage, and took the oath of allegiance, after he had sworn to confirm the liberties and privileges of the people. His imprudence, however, in preferring on all occasions his French subjects to the English, soon excited a jealousy against him, which proved very prejudicial to his cause. This jealousy was greatly increased by the death-bed confession of the Count de Melun, one of his courtiers, who declared to those about him, that it was Louis's design to exterminate the English barons as traitors,

^{England.} and to bestow their dignities and estates upon his French subjects, on whose fidelity he could more safely rely. This caused a considerable desertion among Louis's party: so that John once more found himself in a condition to make an effort for his crown. He resolved to penetrate into the heart of the kingdom; and, for this purpose, he departed from Lynn, and took the road towards Lincolnshire at the head of a great body of troops. His road lay along the shore, which was overflowed at high water; but the king, not being apprised of this, or being ignorant of the tides of the place, lost all his carriages, treasure, and baggage by their influx. He himself escaped with the utmost difficulty, and arrived at the abbey of Swinestead; where his grief for the loss he had sustained, and the distracted state of his affairs, threw him into a fever, which soon appeared to be attended with fatal symptoms. He died at Newark in the year 1216, the 51st ¹⁴⁷ Death of King John of his age, and 18th of his reign. He left two legitimate sons: Henry, who succeeded him on the throne, and was about nine years of age; and Richard, who was about seven. He left also three daughters; Jane, married to Alexander king of Scotland; Eleanor, married to the earl of Pembroke; and Isabella, married to the emperor Frederic II.

When John died, the earl of Pembroke was marshal of England. By this office he was at the head of the army, and of consequence, in times of such turbulence, at the head of the state. He was a nobleman of great honour and fidelity, and had continued faithful to John in his greatest reverses of fortune. He now determined to support the authority of the infant Prince Henry; and therefore carried him immediately to Gloucester, where the ceremony of coronation was performed, in the presence of Gualo the legate and a very few noblemen, by the bishops of Winchester and Bath. The young prince was obliged to swear fealty ¹⁴⁸ Henry III. to the pope, and renew the homage which his father had done for the kingdom; after which the earl of Pembroke was chosen protector.

Till the king arrived at the years of maturity, the transactions of his reign can only be considered as the consequences of the disposition of his tutors. Pembroke caused him grant a new charter of liberties, consisting of the concessions extorted from John, with some alterations; and the next year it was renewed, with the addition of some other articles. Thus these famous charters were brought very nearly to the shape in which they have ever since stood; and they were, during many generations, esteemed 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 in a manner the basis of the English monarchy, and a kind of original contract, which both limited the authority of the king, and ensured the conditional allegiance of his subjects. Though often violated, they were still claimed and recalled by the nobility and people; and as no precedents were supposed valid that infringed them, they rather acquired, than lost, authority, from the frequent attempts made against them, in several ages, by regal and arbitrary power.

¹⁴⁹ He grants new charters. These charters were made use of by Pembroke as arguments to draw off the malecontent barons from their allegiance to Louis. He represented to them, that, whatever

England. whatever jealousy they might have entertained against the late king, a young prince, the lineal heir of their ancient monarchs, had now succeeded to the throne, without succeeding either to the resentments or principles of his predecessor: That the desperate expedient, which they had employed, of calling in a foreign potentate, had, happily for them, as well as for the nation, failed of entire success; and it was still in their power, by a quick return to their duty, to restore the independence of the kingdom, and to secure that liberty for which they so zealously contended: That, as all past offences of the barons were now buried in oblivion, they ought, on their part, to forget their complaints against their late sovereign; who, if he had been anywise blameable in his conduct, had left to his son the salutary warning to avoid his paths, which had led to such fatal extremities: And that, having now obtained a charter for their liberties, it was their interest to show, by their conduct, that the acquisition was not incompatible with their allegiance; and that the rights of the king and people, so far from being hostile and opposite, might mutually support and sustain each other.

150
Decline of
Prince
Louis's par-
ty.

These considerations, enforced by Pembroke's known character of constancy and fidelity, had a very great influence on the barons. Most of them began to negotiate with him, and many actually returned to their duty. At the same time Louis continued to disgust those of his own party by the preference which he visibly gave to the French. Though he went over to France, therefore, and brought fresh succours from thence, he found that his party was greatly weaker than before, by the desertion of his English confederates; and that the death of King John had, contrary to his expectations, occasioned the total ruin of his affairs. In a short time Pembroke was so much strengthened by deserters from Louis's party, that he ventured to invest Mount Sorel; though upon the approach of the count de Perche with the French army, he desisted from that enterprise. The French general immediately marched to Lincoln; and, being admitted into the town, laid siege to the castle, and soon reduced it to extremity. Pembroke summoned his forces from every quarter, in order to relieve this important place; and he appeared so much superior to the French, that they shut themselves up within the city, resolving to take shelter there. But the garrison of the castle, having received a strong reinforcement, made a vigorous sally upon the besiegers, while the English army assaulted them from without. The French army was totally routed; the count de Perche with only two persons more were killed; but many of the chief commanders, and about 400 knights, were made prisoners. On the news of this fatal event, Louis raised the siege of Dover, and retired to London; where he received intelligence of a new disaster, which put an end to all his hopes. A French fleet, which carried a strong reinforcement, had appeared on the coast of Kent; where they were attacked and repulsed with considerable loss by Philip d'Albiny. He is said to have gained the victory by the following stratagem. Having got the wind of the French, he came down upon them with violence; and throwing on their faces a great quantity of quicklime, which he purposely carried on board, they were so blinded that they were

disabled from defending themselves. This misfortune so discouraged the barons who yet adhered to Louis, that they came from every quarter to make their submission to Pembroke: and Louis himself, finding his affairs totally desperate, was glad to make his escape from a country where every thing was become hostile to him. He therefore concluded a peace with the protector; promised to evacuate the kingdom; and only stipulated, in return, an indemnity to his adherents, and a restitution of their honours and fortunes, together with the free and equal enjoyments of those liberties which had been granted to the rest of the nation.

England.
151
He leaves
the king-
dom.

When the king grew up, he was found to be very unfit for the government of such a turbulent people as the English at that time were. Though his temper was mild and humane, he was also very weak, sickle, and irresolute. He disgusted the people by the cares he bestowed on foreigners; and this disgust rose once to such a height, that the barons refused to assemble in the general council of the nation, or parliament, at his desire. When commanded to do so, they sent a message to Henry, desiring him to dismiss his foreigners; otherwise they would drive both him and them out of the kingdom, and put the crown on the head of one who was more worthy to wear it. The facility of Henry's temper also induced him to heap riches upon his foreign favourites in a manner which he could by no means afford: this often brought him into very great straits; and to relieve himself, he was obliged to have recourse to many arbitrary measures, which he could not otherwise have chosen. Nothing, however, of very great moment happened till the year 1255, when the pope found means to embark Henry in a scheme for the conquest of Naples, or Sicily on this side the Fare, as it was called; an enterprise which not only brought much dishonour on the king, but involved him for some years in very great expence and trouble. The court of Rome some time before had reduced the kingdom of Sicily to the same state of feudal vassalage which he pretended to exercise over England; but Mainfroy, an usurper, under pretence of governing the kingdom for the lawful heir, had seized the crown, and was resolved to reject the pope's authority. As the pope found that his own force alone was not sufficient to gain his point, he had recourse to Richard the king of England's brother, who had been created earl of Cornwall, and had such talents for amassing money, that he was reckoned the richest prince in Christendom. To him the pope offered the kingdom of Sicily, upon the single condition of his conquering it from the usurper. Richard was too wise to accept this offer; upon which the pope applied to Henry, and offered him the crown of Sicily for his second son Edmund. Henry, dazzled by this proposal, without reflecting on the consequences, or without consulting his brother or the parliament, gave the pope unlimited credit to expend whatever sums he thought necessary for completing the conquest of Sicily. In consequence of this unlimited grant, his holiness determined to exert his apostolical authority to the utmost, in extorting money from the English. A crusade was published, requiring every one who had taken the cross against the infidels, or even vowed to advance money for that purpose, to support the war against Mainfroy, whom he accused as being a more terrible enemy

152
The pope
undertakes
the con-
quest of
Sicily for
Henry's
son.

153
Intolerable
extortions
by his
holiness.

England. enemy to the Christian faith than any Saracen. A tenth on all the ecclesiastical benefices in England was levied for three years; and orders were given to excommunicate the bishops who did not make punctual payment. A grant was made to the king of the goods of intestate clergymen, as well as of the revenues of vacant benefices and those of non-residents. These taxations, however grievous, were submitted to with little murmuring; but another suggested by the bishop of Hereford excited the most violent clamours. This prelate, who at that time resided at the court of Rome, drew bills on all the abbots and bishops of the kingdom, to the amount of no less than 150,540 marks, which he granted to Italian merchants in consideration of the money they had advanced or pretended to advance for the support of the Sicilian war. As it was apprehended that the English clergy would not easily submit to such an extraordinary demand, a commission was given to Rustand, the pope's legate, to use his authority. An assembly of the prelates and abbots was accordingly summoned; who, on hearing the proposal sanctified with the names both of the pope and king, were struck with the utmost surprise and indignation. A violent altercation took place; during which the legate told them, that all ecclesiastical benefices were the property of the pope, and that he might dispose of them as he pleased. The affair ended, however, in the submission of the clergy: but the barons still continued refractory, and for some time answered the king's demands of supplies with expostulations; urging the king's partiality to foreigners, and the various injuries the nation had sustained from the servants of the crown. The great council of the nation, which had lately obtained the name of *parliament*, was therefore dissolved, and another called, but with as little success as before. The king, however, had involved himself in so much debt, that a large supply was become absolutely necessary; and as that could by no means be obtained from parliament, he was now reduced to the humiliating expedient of going about among such of his subjects as he thought most attached to him, and begging assistance from them at their own houses. At length his barons, perceiving the exigences to which he was reduced, seemed willing to afford him aid; and, upon his promising to grant them a plenary redress of grievances, a very liberal supply was obtained, for which he renewed their charter with more than usual solemnity. All the prelates and abbots were assembled with burning tapers in their hands; the magna charta was read in their presence; and they denounced sentence of excommunication upon all who should infringe upon its decisions. They then put out their tapers on the ground, and exclaimed, "May every soul that proves false to this agreement so sink and corrupt in hell." The king subjoined, "So help me God, I will inviolably keep all these things, as I am a man, as I am a Christian, as I am a knight, and as I am a king crowned and anointed."

[153]
Henry solemnly renews Magna Charta.

154
He breaks his engagements, which occasions a revolution.

No sooner had the king received the supplies of which he stood so much in need, than he forgot all his engagements, put his confidence entirely in foreign counsellors, and evaded or broke through in numberless instances the charters he had given. This conduct rendered him so obnoxious to the barons, that Simon Mountfort earl of Leicester, a man of a very violent

and ambitious temper, determined to attempt an innovation in the government. He formed a powerful confederacy against the king, and the designs of the conspirators were effectually put in execution in the year 1258. Henry had summoned a parliament in expectation of receiving supplies for his Sicilian project; when the barons appeared in the hall, clad in complete armour, with their swords by their sides. The king, struck with this unusual appearance, asked them what was their purpose, and whether they pretended to make him their prisoner? Roger Bigod, earl mareschal, answered in name of the rest, that he was not their prisoner; that they even intended to grant him large supplies, in order to fix his son on the throne of Sicily; that they only expected some return for this expence and service; and that as the king had frequently made submissions to the parliament, had acknowledged his past errors, and had still allowed himself to be carried into the same path, which gave them such reason of complaint, he must now yield to more strict regulations, and confer authority on those who were able and willing to redress the public grievances. Henry instantly assured them of his intentions to grant them all possible satisfaction; and for that purpose summoned another parliament at Oxford, to digest the new plan of government, and to elect proper persons who were to be entrusted with the chief authority. This assembly, afterwards called the *mad parliament*, went very expeditiously to work on the business of reformation. Twenty-four barons were appointed, with supreme authority, to reform the abuses of the state; and Leicester was placed at their head. Their first step was to order four knights to be chosen out of each county, who should examine into the state of their respective constituents, and should attend at the ensuing parliament to give information of their complaints. They ordained that three sessions of parliament should be regularly held every year; that a new high sheriff should be elected annually; that no wards nor castles should be entrusted to foreigners, no new forests made, nor the revenues of any counties let to farm.

These constitutions were so just, that some of them remain to this day. But the parliament having once obtained the sovereign power, took care not to part with it again. They not only protracted the time of their sitting under various pretences; but at last had the effrontery to impose an oath upon every individual of the nation, declaring an implicit obedience to all the statutes executed or to be yet executed by the barons who were thus appointed as rulers. They not only abridged the authority of the king, but the efficacy of parliament also; giving up to 12 persons the whole parliamentary power between each session.— Their usurpations were first opposed by the knights of the shire, whom they themselves had appointed. These had for some time begun to be regularly assembled in a separate house, to consider of the national grievances; the first of which was the conduct of the 24 rulers. They represented, that though the king had performed all that was required of him, the barons had hitherto done nothing on their part that showed an equal regard for the people; that their own interest and power seemed the only aim of all their decrees; and they even called upon the king's eldest son Prince Edward,

England.

155
Bad conduct of the new rulers.

England. Edward to interpose his authority, and save the sinking nation.

156
Opposed by
Prince Ed-
ward.

The prince was at this time about 22 years of age, and by his active and resolute conduct had inspired the nation with great hopes. He told those who made the application to him, that he had sworn to the late constitutions; and, on that account, though they were contrary to his own private opinions, he was resolved not to infringe them. At the same time, however, he sent a message to the barons, requiring them to bring their undertaking to an end, or otherwise to expect the most vigorous resistance to their usurpations. On this the barons were obliged to publish a new code of laws, which, though it contained scarce any thing material, yet, it was supposed, would for a while dazzle the eyes of the people, until they could take measures to establish their authority upon surer foundations. In this manner, under various pretences, they continued their power for three years; while the whole nation loudly condemned their treachery, and the pope himself at last absolved the king and his subjects from the oath they had taken to obey their injunctions. Soon after this, a parliament was called, and the king reinstated in his former authority. The barons were obliged to submit for a time; but the earl of Leicester having joined the Welsh, who at this time made an irruption into England, the kingdom was reduced to the most deplorable situation. The pusillanimity of the king prevented any proper or judicious method from being pursued for extricating the people from their distresses; and at last a treaty was concluded with the barons on the most disadvantageous terms that can be imagined. They were restored to the sovereignty of the kingdom, took possession of all the royal castles and fortresses, and even named the officers of the king's household. They summoned a parliament to meet at Oxford, in order more fully to settle the plan of government; and by this assembly it was enacted that the authority of the 24 barons should continue not only during the life of King Henry, but also during that of Prince Edward.

157
Who is de-
feated and
taken pri-
soner, with
the king
and his
brother.

These scandalous conditions would have been easily complied with by King Henry; but they were utterly rejected by Prince Edward, and a civil war immediately ensued. The prince was at first successful; but, through his impetuosity, occasioned the loss of a great battle, in which his father and uncle were taken prisoners, and he himself was obliged soon after to surrender to the earl of Leicester. The king was now reduced to the most deplorable situation. His partisans were totally disarmed, while those of the earl of Leicester still kept themselves in an offensive posture. Leicester seized the estates of no fewer than 18 barons; engrossed to himself the ransom of all the prisoners; monopolized the sale of wood to foreign markets; and at last ordained that all power should be exercised by nine persons, who were to be chosen by three others, or the majority of them; and these three were the earl of Leicester himself, the earl of Gloucester, and the bishop of Chichester.

158
First House
of Com-
mons.

The miserable situation to which the kingdom was now reduced, proved at last the means of settling the government on a more proper foundation. Leicester, in order to secure himself, was obliged to have recourse to an aid, till now entirely unknown in England, namely, that of the body of the people. He called a

parliament, where, besides the barons of his own party, and several ecclesiastics who were not proper tenants of the crown, he ordered returns to be made of two knights from every shire; and also deputies from the boroughs, which had been hitherto considered as too inconsiderable to be allowed any share in the legislation. This parliament was called on the 20th of January 1265: and here we find the first outline of an English House of Commons; an institution which has ever since been considered as the bulwark of British liberty.

England,

The new parliament was far from being so compliant to Leicester as he had desired or expected. Many of the barons who had hitherto steadfastly adhered to his party were disgusted with his boundless ambition; and the people, who found that a change of masters was not a change from misery to happiness, began to wish for the re-establishment of royal authority. Leicester at last, to make a merit of what he could not prevent, released Prince Edward from his confinement, and had him introduced at Westminster-hall, where his freedom was confirmed by the unanimous voice of the barons. But though Leicester had all the popularity of restoring the prince, he was yet politic enough to keep him guarded by his emissaries, who watched all his actions. At last, however, he found means to make his escape in the following manner. The duke of Gloucester, being disgusted with Leicester, retired from court, and went to his estates on the borders of Wales. His antagonist pursued him thither; and to give the greater authority to his arms, carried the king and prince of Wales along with him. This furnished young Edward with the opportunity he had so long desired. Being furnished by the earl of Gloucester with a horse of extraordinary swiftness, he took leave of his attendants, who were in fact his guards, but were not able to come up with him. They pursued him, however, for some time; but the appearance of a body of troops belonging to Gloucester soon put an end to their pursuit.

The prince no sooner recovered his liberty, than the royalists joined him from all quarters, and an army was soon procured which Leicester could not withstand. This nobleman now found himself in a remote quarter of the kingdom; surrounded by his enemies; and debarred from all communication with his friends by the river Severn, whose bridges Edward had broken down. In this extremity, he wrote to his son to hasten to his assistance from London, with a considerable body which he had under his command. With this view his son advanced to Kenilworth; but here he was surprised, and his army entirely dispersed by Prince Edward. The young prince, immediately after this victory, advanced against Leicester himself; who, ignorant of the fate of his son's army, had passed the Severn in boats. He was by no means able to cope with the royalists; his men being inferior both in numbers and resolution to their antagonists. His army was defeated with great slaughter. Leicester himself was slain, though he called out for quarter, together with his eldest son Henry, and about 160 knights and other gentlemen. The old king had been purposely placed by the rebels in the front of the battle, where he was wounded, and in great danger of being killed; but, crying out, "I am Henry of Winchester your king," he was saved and put in a place of security by his son,

159
Prince Ed-
ward recovers his li-
berty.

160
Earl of Lei-
cester de-
feated and
killed.

^{England.} who had flown to his assistance. The body of Leicester being found among the dead, was barbarously mangled by one Roger Mortimer; and then sent to his widow, as a testimony of the royal party's barbarity and success.

This victory, gained at Evesham, proved decisive in favour of the royal party. Almost all the castles, garrisoned by the barons, hastened to make their submissions, and opened their gates to the king. The Isle of Axholme alone, and that of Ely, trusting to the strength of their situation, ventured to make resistance; but were at last reduced, as well as the castle of Dover, by the valour and activity of Prince Edward. Adam de Gourdon, a courageous baron, maintained himself some time in the forests of Hampshire, committing depredations in the neighbourhood; and obliged the prince to lead a body of troops into that country against him. Edward attacked the camp of the rebels; and being transported by the ardour of action, leaped over the trench with a few followers, and encountered Gourdon himself in single combat. The victory was long disputed between these two valiant combatants; but ended at last in the prince's favour, who wounded his antagonist, threw him from his horse, and took him prisoner. He not only granted him his life; but introduced him that very night to the queen at Guildford, procured his pardon, and was ever after faithfully served by him.

In 1271, Prince Edward, having settled the affairs of the kingdom, undertook an expedition to the Holy Land, where he signalized himself by many acts of valour. The king's health declined visibly after the departure of his son; and at last, worn out with cares and the infirmities of age, he expired at St Edmonsbury on the 16th of November 1272, in the 64th year of his age and the 56th of his reign.

Prince Edward had reached Sicily in his return from the Holy Land, when he received an account of his father's death; at which he expressed much concern. As he knew that England was at that time in a state of perfect tranquillity, he was in no haste to return, but spent near a year in France before he made his appearance in England. He was received by his subjects with the utmost joy, and crowned at Westminster by Robert archbishop of Canterbury on the 19th of August 1274. He immediately applied himself to the correcting of those disorders which the civil commotions, and weak administration of his father, had introduced. A system of strict justice, bordering on severity, was introduced and kept up through the whole of this reign. The Jews were the only part of his subjects whom Edward oppressed. Many arbitrary taxes were levied upon them; 280 of them were hanged at once for adulterating the coin; the goods of the rest were confiscated, and all of them banished the kingdom.

In 1276, the king undertook an expedition against Lewellyn prince of Wales, who had refused to do homage for his crown. The conquest of that country was not fully accomplished till the year 1283; after which the principality of Wales was annexed to the crown of England, and thenceforth gave a title to the king's eldest son.—In 1286, the settlement of Wales appeared so complete, that the king went abroad in order to make peace between Alfonso king of Arra-

gon and Philip le Bel king of France, who had a difference about the kingdom of Sicily. He succeeded in his negotiations; but, staying abroad three years, he found that many disorders had been introduced in his absence. Many instances of robbery and violence had broke out in all parts of England; but the corruption of the judges, by which the fountains of justice were poisoned, was of still more dangerous consequence. Edward, in order to remedy this prevailing abuse, summoned a parliament, and brought the judges to a trial; where all of them except two, who were clergymen, were convicted of this flagrant iniquity, were fined, and deposed from their office. The amount of the fines levied upon them is of itself a sufficient proof of their guilt, being above 100,000 marks; an immense sum in those days, sufficient to defray the expences of a war betwixt two great nations. The king afterwards made all the new judges swear that they would take no bribes; but the deposing and fining the old ones was the more effectual remedy.

In 1291, King Edward began to meditate the conquest of Scotland, which employed him during the rest of his life; but which, though that kingdom was by him reduced to the greatest distress, he was never able to accomplish †. At the same time, he was engaged in expensive contests with France; and these multiplied wars and preparations for war, by obliging him to have frequent recourse to parliamentary supplies, became the remote causes of great and important changes in the government. The parliament was modelled into the form which has continued ever since. As a great part of the property of the kingdom, by the introduction of commerce and improvements in agriculture, was transferred from the barons to the lower class of people, so their consent was thought necessary for raising the supplies. For this reason, the king issued writs to the sheriffs, enjoining them to send to parliament, along with two knights of the shire, two deputies from each borough within their county; and these provided with sufficient powers from their constituents to grant such demands as they should think reasonable for the safety of the state. The charges of these deputies were to be borne by the boroughs which sent them; and so far were they from considering this deputation as an honour, that nothing could be more displeasing to any borough than to be thus obliged to send a deputy, or to any individual than to be thus chosen. The authority of these commoners, however, increased through time. Their union gave them weight; and it became customary among them, in return for the supplies which they granted, to prefer petitions to the crown for the redress of those grievances under which the nation was supposed to labour. The more the king's necessities increased, the more he found it necessary to give them an early redress; till, from requesting, the commons proceeded to requiring; and having all the property of the nation, they by degrees began also to be possessed of the power.

Edward I. died of a dysentery at Carlisle on the 7th of July 1307, as he was leading a great army into Scotland, against the inhabitants of which he had vowed the most dreadful vengeance. He was succeeded by his son Edward II. whom he had charged with his dying breath to prosecute the war against Scotland, and never to desist till he had finally subdued the

M

kingdom.

161
Death of
Henry III.

162
Edward I.

163
Conquers
Wales.

* See Wales.

England.

164
Attempts
the con-
quest of
Scotland.

† See Scot-
land.

165
New-mo-
dels the
parliaments

166
Dies and is
succeeded
by Edw. II.

England. kingdom. But the new king was of a very different disposition from his father. The Scots gradually recovered their power; and in 1314 gave the English such a terrible defeat at Bannockburn, that for many years no superiority of numbers could encourage them to look the Scots in the face. See SCOTLAND.

167
Discontents
of his sub-
jects.

The reign of Edward II. affords no particulars of great moment. Being a prince of a weak understanding, though endued with no remarkable bad qualities, his reign was one continued series of quarrels with his turbulent subjects. His favourites were the most general causes of discontent. The first of these was one Piers Gaveston, the son of a Gascon knight of some distinction, who had honourably served the late king, and who, in reward for his services, had obtained an establishment for his son in the family of the prince of Wales.—To be the favourite of any king whatever, is no doubt in itself a sufficient offence to the rest of the courtiers. Numberless faults were therefore found with Gaveston by the English barons. When the king went over to France to espouse the princess Isabella, to whom he had been long contracted, Gaveston was left guardian of the realm, with more ample powers than had usually been conferred in such a case. But when the queen, who was of an imperious and intriguing spirit, arrived, Gaveston had the misfortune to fall under her displeasure also, on account of the ascendancy he had acquired over the king. A conspiracy was therefore soon formed against the favourite; at the head of which were the queen, and the earl of Lancaster, cousin-german to the king, and the most opulent and powerful nobleman in England. The king, unable to resist such a combination, was at last obliged to banish Gaveston; but recalled him some time after. This was sufficient to spread an alarm over the whole kingdom: a civil war ensued; and the nobility having got Gaveston into their hands, soon freed themselves of any farther apprehensions from him, by putting him to death.

After the unfortunate defeat at Bannockburn, King Edward chose a new favourite named *Hugh le Despenser*. He was a young man of a noble English family, some merit, and very engaging accomplishments. His father was a person of a much more respectable character than the son; but the being admitted to a share of King Edward's favour was a sufficient crime. The king imprudently dispossessed some lords of their estates, in order to bestow them upon this favourite; and this was a sufficient pretence for openly attacking both the father and son. The earls of Lancaster and Hereford flew to arms. Sentence was procured from parliament of perpetual exile against the two Spensers, with a forfeiture of all their estates. At last the king took the field at the head of 30,000 men, and pressed the earl of Lancaster so closely, that he had not time to collect his forces together; and, flying from one place to another, he was at last stopped in his way towards Scotland, and made prisoner. He was immediately condemned by a court-martial; and executed on an eminence near Pomfret, with circumstances of the greatest indignity.

Spenser now triumphed for some time over his enemies; most of the forfeitures were seized for his use,

and he is said to have been guilty of many acts of rapine and injustice. But he was soon opposed by a more formidable enemy. Queen Isabella fled to France, and refused to return to England till Spenser was removed from the royal presence, and banished the kingdom. Thus she made herself popular in England, where Spenser was universally disliked; and she had the pleasure of enjoying the company of a young nobleman named *Mortimer*, upon whom she had lately placed her affections. The queen's court, therefore, became a sanctuary for all the malecontents who were banished their own country, or who chose to come over. When she thought matters were ripe for her purpose, she set sail from Dort harbour, accompanied by 3000 armed men. She landed without opposition on the coast of Suffolk, on the 24th of September 1326; and she no sooner appeared, than there seemed to be a general revolt in her favour. The unfortunate king found the spirit of disloyalty spread over the whole kingdom. He had placed some dependence on the garrison of Bristol, which was under the command of the elder Spenser; but they nutinied against their governor; and that unfortunate favourite was delivered up, and condemned by the tumultuous barons to the most ignominious death. He was hanged on a gibbet in his armour; his body was cut in pieces and thrown to the dogs; and his head was sent to Winchester, where it was set on a pole, and exposed to the insults of the populacc. Young Spenser did not long survive his father. He was taken, with some others who had followed the fortunes of the wretched king, in an obscure convent in Wales. The queen had not patience to wait the formality of a trial; but ordered him to be immediately led forth before the insulting populace, and seemed to take a savage pleasure in beholding his distress. He was executed on a gibbet 50 feet high; his head was sent to London, where it was received by the citizens with brutal triumph, and fixed on the bridge.

In the mean time the king, who hoped to find refuge in Wales, was quickly discovered, and delivered up to his adversaries, who insulted him in the grossest manner. He was conducted to the capital amidst the insults and reproaches of the people, and confined in the tower. A charge was soon exhibited against him; in which no other crimes but his incapacity to govern, his indolence, his love of pleasure, and his being swayed by evil counsellors, were objected against him. His deposition, however, was quickly voted by parliament; he was assigned a pension for his support; his son Edward, a youth of 14, was chosen to succeed him, and the queen was appointed regent during the minority. The deposed monarch did not long survive the loss of his crown. He was at first consigned to the custody of the earl of Lancaster; but this nobleman showing some marks of respect and pity, he was taken out of his hands, and delivered over to the lords Berkeley, Mautravers, and Gournay, who were entrusted alternately, each for a month, with the charge of guarding him. While he was in Berkeley's custody, he was still used with some degree of humanity; but when the turn of Mautravers and Gournay came, every species of indignity was practised upon him, as if they had designed to accelerate his death by the bitterness of his sufferings. It is reported, that one day when Edward

England.
168
Insurrec-
tion against
him by the
queen.

169
Edward de-
posed;

England. Edward was to be shaved, they ordered cold and dirty water to be brought from a ditch for that purpose; and when he desired it to be changed, and was still denied his request, he burst into tears and exclaimed, That in spite of their insolence he would be shaved with clean and warm water. As his persecutors, however, saw that his death might not arrive, even under every cruelty they could practise, and were daily afraid of a revolution in his favour, they determined to rid themselves of their fears by destroying him at once. Mortimer, therefore, secretly gave orders to the two keepers, who were at his devotion, instantly to dispatch the king; and these ruffians contrived to make the manner of his death as cruel and barbarous as possible. Taking advantage of Berkeley's sickness, in whose custody he then was, and who was thereby incapacitated from attending his charge, they came to Berkeley-castle, and put themselves in possession of the king's person. They threw him on a bed, and held him down with a table which they had placed over him. They then ran a horn pipe up his body, through which they conveyed a red-hot iron; and thus burnt his bowels without disfiguring his body. By this infernal contrivance they expected to have their crime concealed: but the horrid shrieks of the king, which were heard at a distance from the castle, gave a suspicion of the murder; and the whole was soon after divulged by the confession of one of the accomplices. Gournay and Mautravers were held in detestation by all mankind; and when the ensuing revolution deprived their protectors of power, they found it necessary to fly the kingdom. Gournay was afterwards seized at Marseilles, delivered over to the seneschal of Guicane, and put on board a ship with a view of carrying him over to England; but he was beheaded at sea, by secret orders, as was supposed, of some nobles and prelates in England, anxious to prevent any discovery which he might make of his accomplices. Mautravers concealed himself for some years in Germany; but having found means of rendering some services to Edward III. he ventured to approach his person, threw himself on his knees before him, and received a pardon.

170
And cruelly murdered.

By the death of Edward II. the government fell entirely into the hands of the queen and her paramour Mortimer. The parliament, which raised young Edward to the throne, had indeed appointed 12 persons as his privy-council, to direct the operations of government. Mortimer excluded himself, under a show of moderation; but at the same time secretly influenced all the measures that came under their deliberation. As this influence began very soon to be perceived, and the queen's criminal attachment to Mortimer was universally known, these governors soon became very obnoxious to the people. The first stroke given to Mortimer's power was during an irruption of the Scots, when the favourite prevented the young king from attacking the enemy. Though it is very probable that the English army would have been destroyed by making an attack on an army situated in such an advantageous post as the Scots at that time occupied, Mortimer incurred great blame on that account. He was accused of having allowed the Scots to make their escape; and the general disgust on this account was increased by his concluding a peace with that kingdom,

wherein the English renounced all title to the sovereignty of Scotland for the sum of 30,000 marks. Soon after Mortimer seized and executed the earl of Kent, brother to the late king; who, supposing Edward II. to be still alive, had formed a design of reinstating him in his kingdom. The execution was so sudden, that the young king had not time even to interpose in his behalf; and Mortimer soon after seized this nobleman's estate for his own use, as he did also the immense fortunes of the Spensers.

Edward, finding the power of Mortimer a continual restraint upon himself, resolved to shake off an authority that was likewise grown odious to the whole nation. The queen and Mortimer had for some time chosen the castle of Nottingham for their residence. It was strictly guarded, the gates were locked every night, and the keys carried to the queen. It was therefore agreed between the king and some of the barons, who secretly entered into his designs, to seize upon them in this fortress. Sir William Eland the governor was induced to admit them through a subterraneous passage, which had been formerly contrived for an outlet, but was now clogged up with rubbish, and known only to one or two. Through this passage the noblemen in the king's interest entered the castle in the night-time; and Mortimer, without having it in his power to make any resistance, was seized in an apartment adjoining to that of the queen. The parliament, which was then sitting, condemned him, without either permitting him to make his defence, or examining a single witness against him. He was hanged on a gibbet at a place called *Elmes*, about a mile from London. A similar sentence was passed against some of his adherents, particularly Gournay and Mautravers, who found an opportunity of escaping as above mentioned. The queen, who was perhaps the most culpable of the whole, was screened by the dignity of her station. She was, however, deposed from all share of power; and confined for life to the castle of Rising, with a pension of 3000 pounds a-year. From this confinement she was never set free, though the king paid her an annual visit of ceremony. She lived 25 years after her deposition.

England.

172
Mortimer executed.

Edward III. proved the greatest warrior that ever sat on the English throne. He first attempted to raise Edward Baliol to the sovereignty of Scotland; but this he found impossible fully to accomplish. Edward next formed a project of invading and conquering France, to the sovereignty of which he pretended a right. His first expectations were attended with little success, that on his return to England he found the nation very much discontented, and himself harassed by his numerous creditors, without any sufficient resource for paying them. Being determined, however, not to bear any blame himself if he could throw it anywhere else, he took the first opportunity of wreaking his vengeance upon his subjects. Finding therefore the tower of London negligently guarded on his arrival, he imprisoned the constable and all his inferior officers, treating them with the greatest severity. He then fell upon the sheriffs and collectors of the revenue, whom he dismissed from their employments, and appointed an inquiry into their conduct to be made by persons who, knowing the king's humour, were sure to find every one guilty who came before them. The keeper of the privy-seal, the chief-justice, the mayor of London,

173
Edward invades France unsuccessfully.

174
his arbitrary behaviour on his return.

England. the bishops of Chichester and Litchfield, with the chancellor and treasurer, were deposed and imprisoned. In this career of resentment and cruelty, however, he found himself opposed by the archbishop of Canterbury, whom he had appointed to collect the taxes laid on for the support of the French war. That prelate happening to be absent at the time of the king's arrival, did not immediately feel the effects of his resentment. Being informed, however, of the humour in which his sovereign was, he issued a sentence of excommunication against all who, on any pretence whatever, should exercise violence against the persons or estates of clergymen, or who infringed those privileges secured by the great charter, or who accused a prelate of treason, or any other crime, in order to bring him under the king's displeasure. A regular combination was formed against the king by the clergy, with the primate at their head; who, to excite the indignation of the people as much as possible, reported, that the king intended to recal the general pardon and the remission to old debts which had been granted, and to impose new and arbitrary taxes without consent of parliament. The archbishop also, in a letter to the king, informed him, that there were two powers by which the world was governed, viz. the holy pontifical apostolical dignity and the regal authority; of which the clerical power was evidently the supreme, as the priests were to answer even for the conduct of kings at the last judgment; and were besides the spiritual fathers of all the faithful, kings and princes not excepted; having, besides, a heavenly charter, entitling them to direct their wills and actions, and to censure their transgressions. On this the king resolved to mortify him, by sending no summons to him when the parliament was called: but the prelate, undaunted by this mark of resentment, appeared before the gates of the parliament-house with his crozier in his hand, demanding admittance as the first peer of the realm. This application was rejected for two days, but at last complied with; and the parliament now seemed inclined to abridge the king's authority considerably. They began with observing, that as the great charter had been violated in many points, particularly by the illegal imprisonment of many freemen and the seizure of their goods, it was necessary to confirm it anew, and to oblige all the chief officers of the law and others to swear to the observance of it. It was also required, that whenever any of the great offices became vacant, the king should fill them up by the advice of his council and the consent of such barons as should at the time be found to reside in the neighbourhood of the court. They enacted also, that on the third day of every session the king should resume all such offices into his own hand, excepting those of the justices of the two benches and the barons of exchequer; that the ministers should for the time be reduced to private persons; that they should in that condition answer before parliament to any accusation preferred against them; and that, if they were found in any respect guilty, they should be finally deprived of their offices, and others appointed in their stead. In return for such ample concessions, the king was offered a grant of 20,000 sacks of wool; and such was his urgent necessity, that he was compelled to accept of it even upon these terms. Still, however, he deter-

mined to adhere to his engagements no longer than till this necessity was removed. Though the agreement, therefore, was ratified in full parliament, he secretly entered a protest, that, as soon as his convenience permitted, he would from his own authority revoke what had been extorted from him. This protest was afterwards confirmed by a public edict; in which he asserted, that that statute had been made contrary to law; that it was prejudicial to the prerogatives of the crown, which he had only dissimulated when he seemed to ratify it; and that in his own breast he had never assented to it: and declared, that from thenceforth it had no force or authority. This exertion of arbitrary power, which it might have been imagined would have occasioned a prodigious clamour, was not taken notice of by any of the subsequent parliaments; so that in the course of two years Edward had entirely regained his authority, and obtained a repeal of the obnoxious statute just mentioned. Having thus settled matters to his satisfaction, the king resumed his expedition against France, where he gained great advantages. In his absence the Scots invaded England; but were entirely defeated at Durham, and their king himself taken prisoner. The English king in the mean time continued his victories on the continent; in which he was greatly assisted by Edward surnamed the *Black Prince*, the greatest hero recorded in the English annals. But for the wars of Edward III. and the exploits of this famous prince, see the articles SCOTLAND and FRANCE. The Black Prince died on the 8th of June 1376, and the king survived only about a year. He expired on the 21st of June 1377, and was succeeded by his second son Richard.

As the new king was only eleven years old when he ascended the throne, the government was vested in the hands of his three uncles, the dukes of Lancaster, York, and Gloucester. The different dispositions of these noblemen, it was thought, would cause them check the designs of each other. Lancaster was neither popular nor enterprising; York was indolent and weak; and Gloucester turbulent, popular, and ambitious. Discontents first arose among the common people. They had now acquired a share of liberty sufficient to inspire them with a desire for more, and this desire was greatly increased by the discourses of one John Ball a seditious preacher. He went about the country, and inculcated on his audience, that mankind were all derived from one common stock; and that all of them had equal right to liberty and the goods of nature, of which they had been deprived by the ambition of a few insolent rulers.

These doctrines were greedily swallowed by the populace, who were farther inflamed by a new imposition of three groats a-head upon every person in the kingdom above 15 years of age. This had been granted as a supply by parliament, and was no doubt necessary on account of the many expensive wars in which the kingdom was engaged; but its apparent injustice, in laying no more burden upon the rich than the poor, excited the utmost resentment of the people. The manner, too, of collecting this tax, soon furnished them with an occasion of revolt. It began in Essex, where a report was industriously spread that the peasants were to be destroyed, their houses burned, and their farms plundered. A blacksmith, well known by the name

175
Is opposed
by the
archbishop
of Canter-
bury;

176
And obli-
ged at last
to submit:

England.

177
But regains
his power.

178
Performs
great ex-
ploits in
France.

179
Richard II

England. of Wat Tyler, was the first that excited them to arms. The tax-gatherers coming to this man's house while he was at work, demanded payment for his daughter. This he refused, alleging that she was under the age mentioned in the act. One of these fellows offered to produce a very indecent proof to the contrary, and at the same time laid hold of the maid. This the father resenting, immediately knocked out the ruffian's brains with his hammer. The bystanders applauded the action; and exclaimed that it was high time for the people to take vengeance on their tyrants, and to vindicate their native liberty. The whole country immediately took arms, and the insurgents soon amounted to about 100,000 men. They advanced to Blackheath, where they sent a message to the king, who had taken shelter in the tower, desiring a conference with him. The king was desirous of complying with their demands, but was intimidated by their fierce behaviour. In the mean time, they entered the city, burning and plundering the houses of such as were obnoxious for their power or riches. Their animosity was particularly levelled against the lawyers, to whom they showed no mercy. The king at last, knowing that the tower was not able to resist their assaults, went out among them, and desired to know their demands. To this they made a very humble remonstrance; requiring a general pardon, the abolition of slavery, freedom of commerce in the market-towns, and a fixed rent instead of those services required by the tenure of villenage. The king granted all these requests; and charters were made out by which the grant was ratified. In the mean time, however, another body of these insurgents had broke into the tower, and murdered the chancellor, the primate, and the treasurer, with some other officers of distinction. They then divided themselves into bodies, and took up their quarters in different parts of the city. At the head of one of these was Wat Tyler, who led his men into Smithfield, where he was met by the king, who invited him to a conference under pretence of hearing and redressing his grievances. Tyler ordered his companions to retire till he should give them a signal, and boldly ventured to begin a conference with the king in the midst of his retinue. His demands were, That all slaves should be set free; that all commonages should be open to the poor as well as to the rich; and that a general pardon should be passed for the late outrages. Whilst he made these demands, he now and then lifted up his sword in a menacing manner: which insolence so raised the indignation of William Walworth lord mayor of London, that, without considering the danger to which he exposed his majesty, he stunned Tyler with a blow of his mace; while one of the king's knights riding up, dispatched him with his sword. The mutineers, seeing their leader fall, prepared themselves to take revenge. Their bows were already bent for execution; when Richard, though not yet 16 years of age, rode up to the rebels, and with admirable presence of mind cried out: "What, my people, will you kill your king? Be not concerned for the loss of your leader. I myself will now be your general. Follow me into the field, and you shall have whatever you desire." The multitude immediately desisted, and followed the king into the fields, where he granted them the same charters that he had before granted to their compa-

nions. These charters, however, were soon after revoked, and the common people reduced to the same situation in which they had formerly been.

The courage, address, and presence of mind, which the king had discovered in quelling such a dangerous tumult, gave great hopes to the nation: but, in proportion as Richard advanced in years, these hopes were blasted; and his want of capacity, or at least of solid judgment, appeared in every enterprise he attempted. The king had unluckily lost the favour of the common people after the insurrection just mentioned. He allowed the parliament to revoke the charters of enfranchisement and pardon which had been granted; some of the ringleaders in the late disorders had been severely punished, and some even put to death without any form of process or trial. Thus the popular leaders were greatly exasperated by this cruelty, though probably the king did not follow the dictates of his own mind so much in it as the advice of his counsellors. But having thus lost the favour of one party, he quickly after fell under the displeasure of the other also. Supposing himself to be in too great subjection to his uncles, particularly the duke of Gloucester, he attempted to shake off the yoke, by raising others to such a degree of power as might enable them to rival them. His first favourite was Robert de Vere earl of Oxford, a young man of an agreeable person, but dissolute in his behaviour, who soon acquired an absolute ascendant over him. So much was he determined to show his attachment to this nobleman, that he first created him marquis of Dublin, a title never known in England before; then duke of Ireland; transferring to him the entire sovereignty of that island by patent for life. He gave him in marriage his cousin-german, the daughter of the earl of Bedford; but soon after permitted him to divorce her for another lady with whom he had fallen in love. This nobleman soon became the dispenser of all the king's favours to such a degree, that a conspiracy was formed against him; at the head of which were, Mowbray earl of Nottingham, Fitz Alan earl of Arundel, Piercy earl of Northumberland, Montacute earl of Salisbury, and Beauchamp earl of Warwick. Vere was impeached in parliament; and though nothing of moment was even alleged against him, he was condemned and deprived of his office. They next proceeded to attack the royal authority itself. Under pretence that the king was yet unable to govern the kingdom, though at that time 21 years of age, they appointed a commission of 14 persons to whom the sovereignty was to be transferred for a year. This measure was driven forward by the duke of Gloucester, and none but his own faction were admitted as members of the committee. The king could not without regret perceive himself thus totally deprived of authority. He first endeavoured to gain over the parliament to his interests, by influencing the sheriffs of each county, who were then the only returning officers. This measure failing, he next applied to the judges. They declared, that the commission which had deprived the king of his authority was unlawful, and that those who procured or advised it were punishable with death. Their sentence was quickly opposed by declarations from the lords. The duke of Gloucester armed his partisans, and appeared at Haringay park near Highgate,

England.
180
Dangerous
insurrec-
tion by
Wat Ty-
ler.

England.

182

The king
loses the
favour of
the people.

183

His exces-
sive favour
for the earl
of Oxford.

184

A conspira-
cy against
the king.

181
He is kill-
ed.

England. Highgate, at the head of a body of men sufficient to intimidate the king and all his adherents. These insurgents, sensible of their own power, began by demanding of the king the names of those who had advised him to his late rash measures. A few days afterwards they appeared armed in his presence, and accused by name the archbishop of York, the duke of Ireland, the earl of Suffolk, and Sir Robert Tresilian, one of the judges who had declared in his favour, together with Sir Nicholas Bember, as public and dangerous enemies to the state. The duke of Ireland fled into Cheshire, where he attempted to raise a body of forces; but was quickly obliged to fly into Flanders, on the arrival of the duke of Gloucester with a superior army. Soon after, the king was obliged to summon a parliament, where an accusation was drawn up against five of his counsellors. Of these only Sir Nicholas Bember was present; and he was quickly found guilty, condemned, and executed, together with Sir Robert Tresilian, who had been discovered and taken during the interval. Lord Beauchamp of Holt was soon after condemned and executed; and Sir Simon Burley, who had been appointed the king's governor, shared the same fate, though the queen continued for three hours on her knees before the duke of Gloucester, imploring his pardon.

185
The king takes the power into his own hands.

Such unparalleled insolence and barbarity in a subject could not go unpunished. In 1389, the king at an extraordinary council of the nobility assembled after Easter, to the astonishment of all present, desired to know his age. Being told that he was turned of two and twenty, he alleged that it was then time for him to govern without help; and that there was no reason why he should be deprived of those rights which the meanest of his subjects enjoyed. The lords answered in some confusion, that he had certainly an undisputed right to take upon himself the government of the kingdom. "Yes (replied the king), I have long been under the government of tutors; and I will now first show my right to power by their removal." He then ordered Thomas Arundel, whom the commissioners had lately appointed chancellor, to give up the seals; which he next day delivered to William Wickham bishop of Winchester. He next removed the duke of Gloucester, the earl of Warwick, and other lords of the opposition, from the council; and all the great officers of the household, as well as the judges, were changed.

The king being thus left at liberty to govern as he thought proper, for some time behaved in such a manner as to gain the affections of the people. It does not appear indeed that he ever gave much cause of complaint; but it was impossible for any prince in those days to keep himself secure on the throne but by a very severe and vigorous administration. The duke of Gloucester, perceiving that Richard was not of a warlike disposition, frequently spoke with contempt of his person and government, and deliberated concerning the lawfulness of throwing off all allegiance to him. The king being informed of his conduct by spies appointed for that purpose, at last formed a resolution of ridding himself of Gloucester and his faction at once. He therefore ordered that nobleman to be immediately arrested and sent over to Calais, where there was no danger of his being rescued by his numerous adherents. The

earls of Arundel and Warwick were seized at the same time; and a new parliament, which the king knew would be perfectly obedient to his will, was summoned to Westminster. Here the commission of 14, who had usurped on the royal authority, was annulled for ever; all those acts which had condemned his former ministers were repealed; and the general pardon which the king had formerly given when he assumed the government into his own hands, was revoked. Several of Gloucester's party were condemned and executed, and at last that nobleman himself was called for to take his trial as well as the rest; but he had before been privately dispatched in prison.

England.
186
Duke of Gloucester murdered.

After the destruction of the duke of Gloucester and the heads of his party, a misunderstanding arose among the noblemen who had joined in the prosecution. The duke of Hereford appeared in parliament, and accused the duke of Norfolk of having spoken seditious words against his majesty in a private conversation. Norfolk denied the charge, gave Hereford the lie, and offered to prove his innocence by single combat. The challenge was accepted; but on the day appointed for the duel, the king would not suffer the combatants to engage, but commanded both of them to leave the kingdom. The duke of Norfolk he banished for life, but the duke of Hereford only for ten years. The former retired to Venice, where in a short time he died of a broken heart. Hereford behaved in a resigned and submissive manner; which so pleased the king, that he consented to shorten the time of his banishment four years: he also granted him letters patent, ensuring him of the enjoyment of any inheritance which should fall to him during his absence; but upon the death of his father the duke of Lancaster, which happened shortly after, Richard revoked those letters, and kept the estate to himself.

187
Dukes of Hereford and Norfolk banished.

This last injury inflamed the resentment of Hereford to such a degree, that he formed a design of dethroning the king. He was a great favourite both with the army and people; he was immensely rich, and connected by blood or alliance with all the great families of the nation. The king at the same time, it is said, gave himself up to an idle, effeminate life; and his ministers following his example, the national honour was lost. The number of malecontents daily increased, and only waited for the absence of the king, in order to put their schemes in execution; and this opportunity soon offered.

188
Hereford forms a scheme of dethroning the king.

The earl of March, presumptive heir to the crown, having been appointed the king's lieutenant in Ireland, was slain in a skirmish with the natives of that country; which so incensed Richard, that, unmindful of his precarious situation at home, he went over to Ireland with a considerable army, in order to revenge his death in person. The duke of Lancaster (for that was the title which Hereford assumed on the death of his father) hearing of the king's absence, instantly embarked at Nantz; and with a retinue only of 60 persons in three small vessels, landed at Ravenspur in Yorkshire. The earl of Northumberland, who had long been a malecontent, together with Henry Piercy his son, who from his ardent valour was surnamed *Hospur*, immediately joined him with their forces; and the people flocked to him in such numbers, that in a few days his army amounted to 60,000 men.

Richard,

England.

Richard, in the mean time, continued in perfect security in Ireland for some time. Contrary winds for three weeks together prevented his receiving any news of the rebellion which was begun in his native dominions. He landed therefore at Milford Haven without suspicion, attended by a body of 20,000 men; but immediately found himself opposed by a power which he could by no means resist. His army gradually deserted him, till at last he was obliged to acquaint the duke, that he would submit to whatever terms he pleased to prescribe. The duke did not think proper to enter into any treaty with the king; but carried him to London, where he was confined close prisoner in the Tower, formally deposed by parliament, or rather by the duke of Lancaster, and at last put to death. The manner of his death is variously related. According to some, eight or nine ruffians were sent to the castle of Pomfret, whither the unhappy prince had been removed, in order to dispatch him. They rushed unexpectedly into his apartment; but Richard, knowing their design, resolved to sell his life as dear as possible. He wrested a pole-axe from one of the murderers, with which he killed four of them; but was at length overpowered and killed. Others relate that he was starved in prison; and that, after he was denied all nourishment, he prolonged his life 14 days, by feeding on the flocks of his bed. He died in the year 1399, in the 34th year of his age, and 23d of his reign.—It was during the reign of Richard II. that Wickliff, the noted reformer, published his doctrines in England. See WICKLIFF.

189
Richard deposed and murdered.

190
Duke of Lancaster's claim to the crown.

After sentence of deposition had been pronounced on Richard by both houses of parliament, the throne being then vacant, the duke of Lancaster stepped forth; and having crossed himself on the forehead and on the breast, and called on the name of Christ, gave in his claim to the throne in the following words, which we shall give in the original language. "In the name of Father, Son, and Holy Ghost, I Henry of Lancaster, challenge this rewme of Ynglonde, and the crown, with all the membres and the appurtenances; als I that am descendit by right line of the blode, coming fro the gude King Henry therde, and throge that right that God of his grace hath sent me, with help of kyn, and of my frendes to recover it; the which rewme was in poynt to be oudone by default of governance, and ondoing of the gude laws."

The right which the duke here claimed by descent from Henry III. proceeded on a false story, that Edmund earl of Lancaster, son of Henry III. was really the elder brother of Edward I.; but that, by reason of some deformity in his person, he had been postponed in the succession, and Edward the younger brother imposed on the nation in his stead. The present duke of Lancaster inherited from Edmund, by his mother, the right which he now pretended to the crown; though the falsehood of the story was so generally known, that he thought proper to mention it only in general terms.—No opposition, however, was made to the validity of this title in parliament; and thus commenced the differences between the houses of York and Lancaster, which were not terminated but by many bloody and ruinous wars.

191
Henry IV.

The reign of Henry IV. was little else than a continued series of insurrections. In the very first parlia-

ment he called, no fewer than 40 challenges were given and accepted by different barons; and though Henry had ability and address enough to prevent these duels from being fought, it was not in his power to prevent continual insurrections and combinations against himself. The most formidable one was conducted by the earl of Northumberland, and commenced A. D. 1402. The occasion of it was, that Henry denied the earl liberty to ransom some Scots prisoners which had been taken in a skirmish with that nation. The king was desirous of detaining them in order to increase his demands upon Scotland in making peace; but as the ransom of prisoners was in that age looked upon as a right belonging to those who had taken them, the earl thought himself grievously injured. The injury appeared still the greater, because Northumberland considered the king as indebted to him both for his life and crown. He resolved therefore to dethrone Henry; and to raise to the throne young Mortimer, who was the true heir to the crown, as being the son of Roger Mortimer earl of March, whom Richard II. had deposed his successor. For this purpose, he entered into an alliance with the Scots and Welsh, who were to make an irruption into England at the same time that he himself was to raise what forces he could in order to join them. But when all things were prepared for this insurrection, the earl found himself unable to lead on the troops, by a sudden fit of illness with which he was seized at Berwick. On this, young Percy (surnamed *Hotspur*) took the command; and marched towards Shrewsbury, in order to join the Welsh. But the king had happily a small army with which he intended to have acted against the Scots; and knowing the importance of celerity in civil wars, instantly hurried down, that he might give battle to the rebels. He approached Shrewsbury before a junction with the Welsh could be effected; and the impatience of Percy urged him to an engagement, which at that time he ought to have declined. The evening before the battle, he sent a manifesto to Henry; in which he renounced his allegiance, set the king at defiance, and enumerated all the grievances of which he imagined the nation might justly complain. He reproached him (and very justly) with his perjury; for Henry, on his first landing in England, had sworn upon the gospels, before the earl of Northumberland, that he had no other intention but to recover possession of the duchy of Lancaster, and that he would ever remain a faithful subject to King Richard. He aggravated his guilt, in first dethroning and then murdering that prince; and in usurping on the title of the house of Mortimer; to whom, both by lineal succession and by declarations of parliament, the throne, then vacant by Richard's death, did of right belong. Several other heavy charges were brought against him; which, at that time, could be productive of no other effect than to irritate the king and his adherents to the utmost.

The armies on each side were in number about 12,000; so that they were not unmanageable by their commanders; and as both leaders were men of known bravery, an obstinate engagement was expected. The battle was fought on the 20th of July 1403; and we can scarce find in those ages any other in which the shock was so terrible and constant. At last Percy being killed by an unknown hand, the victory was decided

England.

192
Insurrec-
tion of the
earl of
Northum-
berland.

193
His son de-
seated and
killed at
Shrews-
bury.

England. in favour of the royalists. There are said to have fallen on that day near 2300 gentlemen, and 6000 private men, of whom near two thirds were of Piercy's army.

The earl of Northumberland having recovered from his sickness, and levied an army, was on his march to join his son; but being opposed by the earl of Westmorland, and hearing of the defeat at Shrewsbury, he dismissed his forces, and came with a small retinue to the king at York. He pretended that his sole intention was to mediate between the contending parties; and the king thought proper to accept of his apology, and grant him a pardon for his offence. The other rebels were treated with equal lenity; and none of them, except the earl of Worcester and Sir Richard Vernon, who were regarded as the chief authors of the insurrection, perished by the hands of the executioner. This lenity, however, was not sufficient to keep the kingdom quiet; one insurrection followed another almost during the whole of this reign; but either through Henry's vigilance, or the bad management of the conspirators, they never could unite their forces in such a manner as was necessary for bringing their projects to bear.

194
Archbishop
of York ex-
ecuted.

195
Burning of
heretics in-
troduced.

This reign is remarkable for the first capital punishment inflicted on a clergyman of high rank. The archbishop of York having been concerned in an insurrection against the king, and happening to be taken prisoner, was beheaded without either indictment, trial, or defence; nor was any disturbance occasioned by this summary execution. But the most remarkable transaction of this reign was, the introduction of that absurd and cruel practice of burning people on account of their religion. Henry, while a subject, was thought to have been very favourable to the doctrines of Wickliff; but when he came to the throne, finding his possession of it very insecure, he thought superstition a necessary implement of his authority, and therefore determined by all means to pay court to the clergy. There were hitherto no penal laws against heresy; not indeed through the toleration of the court of Rome, but through the stupidity of the people, who could not perceive the absurdities of the established religion. But when the learning and genius of Wickliff had once broken the fetters of prejudice, the ecclesiastics called aloud for the punishment of his disciples; and Henry, who was very little scrupulous in his conduct, resolved to gratify them. He engaged parliament to pass a law for this purpose: it was enacted, that when any heretic, who relapsed, or refused to abjure his opinions, was delivered over to the secular arm by the bishop or his commissaries, he should be committed to the flames before the whole people. This weapon did not remain long unemployed in the hands of the clergy. William Sautré, rector of St Osthes in London, had been condemned by the convocation of Canterbury; his sentence was ratified by the house of peers; the king issued his writ for the execution; and the unhappy man was burnt alive in the year 1401. The doctrines of Wickliff, however, seem to have already gained ground very considerably in England. In 1405, the commons, who had been required to grant supplies, proposed in plain terms to the king to seize all the temporalities of the church, and employ them as a perpetual fund to serve the exigencies of the state. They insisted that

the clergy possessed a third of the lands of the kingdom; and they contributed nothing to the public burdens; and that their exorbitant riches tended only to disqualify them from performing their ministerial functions with proper zeal and attention. When this address was presented, the archbishop of Canterbury, who then attended the king, objected that the clergy, though they went not in person to the wars, sent their vassals and tenants in all cases of necessity; while at the same time, they themselves who staid at home were employed night and day in offering up their prayers for the happiness and prosperity of the state. The speaker answered with a smile, that he thought the prayers of the church but a very slender supply. The archbishop, however, prevailed in the dispute; the king discouraged the application of the commons; and the lords rejected the bill which the lower house had framed for despoiling the church of her revenues. The commons were not discouraged by this repulse. In 1410, they returned to the charge with more zeal than before. They made a calculation of all the ecclesiastical revenues, which, by their account, amounted to 485,000 marks a-year, and included 18,400 ploughs of land. They proposed to divide this property among 15 new earls, 1500 knights, 6000 esquires, and 100 hospitals; besides 20,000l. a-year, which the king might keep for his own use: and they insisted that the clerical functions would be better performed than at present, by 15,000 parish priests, at the rate of 7 marks a-piece of yearly stipend. This application was accompanied with an address for mitigating the statutes enacted against the Wickliffites or Lollards, so that the king knew very well from what source it came. He gave the commons, however, a severe reply; and further to satisfy the church that he was in earnest, ordered a Lollard to be burnt before the dissolution of parliament.

The king had been for some time subject to fits, which continued to increase, and gradually brought him to his end. He expired at Westminster in 1413, in the 46th year of his age, and the 13th of his reign. He was succeeded by his son Henry V. whose martial talents and character had at first occasioned unreasonable jealousies in the mind of his father, so that he thought proper to exclude him from all share of public business. The active spirit of Henry being thus restrained from its proper exercise, broke out in every kind of extravagance and dissipation. It is even reported, that, when heated with liquor, he scrupled not to accompany his riotous associates in attacking the passengers on the streets and highways, and robbing them of their goods. No sooner, however, did he ascend the throne, than he called together his former companions, acquainted them with his intended reformation, exhorted them to imitate his example; but strictly prohibited them, till they had given proofs of their sincerity in this particular, to appear any more in his presence: after which, he dismissed them with liberal presents. His father's wise ministers, who had checked his riots, found that they had, unknown to themselves, been paying the highest court to their sovereign; and were received with all the marks of favour and confidence. The chief justice, who had formerly imprisoned the prince himself, and therefore trembled to approach the royal presence, met with

England.

196
Henry V.

praises

^{England.} praises instead of reproaches for his past conduct, and was exhorted to persevere in the same rigorous and impartial execution of the laws. The king was not only anxious to repair his own misconduct, but also to make amends for those iniquities into which policy or necessity of affairs had betrayed his father. He expressed the deepest sorrow for the fate of the unhappy King Richard, and even performed his funeral obsequies with pomp and solemnity, and heaped favours upon all those who had shown themselves attached to him. He took into favour the young earl of March, though his competitor for the throne; and gained so far on his gentle and unambitious nature, that he remained ever after sincerely attached to him. The family of Percy was restored to its fortune and honours; and the king seemed desirous to bury all distinctions in oblivion. Men of merit were preferred, whatever party they had been of; all men were unanimous in their attachment to Henry; and the defects of his title were forgotten amidst the personal regard which was universally paid him.

197
Enforces
the laws
against
heretics.

The only party which Henry was not able to overcome was the new sect of Lollards, or reformers of religion. These were now gaining such ground in England, that the Romish clergy were greatly alarmed, and Henry was determined to execute the laws upon them. The head of that party at present was Sir John Oldcastle, Lord Cobham; a nobleman who had distinguished himself by his valour and military talents on many occasions, and acquired the esteem both of the late and present king. His high character and zeal for the new sect pointed him out to Arundel archbishop of Canterbury as a proper object of ecclesiastical fury, and therefore he applied to Henry for permission to indict him. The king desired him first to try gentle methods, and undertook to converse with Lord Cobham himself upon religious subjects. He did so, but could not prevail, and therefore abandoned Cobham to his enemies. He was immediately condemned to the flames: but having found means to make his escape, he raised an insurrection; which was soon suppressed, without any other consequence than that of bringing a stain on the sect to which he belonged. Cobham himself made his escape, but four years afterwards was taken and executed as a traitor. Immediately after, the most severe laws were passed against the Lollards. It was enacted, that whoever was convicted of Lollardy, besides suffering capital punishment according to the laws formerly established, should also forfeit his lands and goods to the king; and that the chancellor, treasurer, justices of the two benches, sheriffs, justices of the peace, and all the chief magistrates in every city and borough, should take an oath to use their utmost endeavours for the extirpation of heresy.

Notwithstanding these terrible laws, the very parliament which enacted them, namely that of 1414, when the king demanded a supply, renewed the offer formerly pressed upon Henry IV. and intreated the king to seize all the ecclesiastical revenues, and convert them to the use of the crown. The clergy were greatly alarmed. They could offer the king nothing of equal value. They agreed, however, to confer on him all the priories alien, which depended on capital abbeys in Normandy, and which had been bequeathed to them

Vol. VIII. Part I.

when that province was united to England. The most effectual method, however, of warding off the blow at present was by persuading the king to undertake a war with France, in order to recover the provinces in that kingdom which had formerly belonged to England. This was agreeable to the dying injunction of Henry IV. He advised his son never to let the English remain long in peace, which was apt to breed intestine commotions; but to employ them in foreign expeditions, by which the prince might acquire honour, the nobility in sharing his dangers might attach themselves to his person, and all the restless spirits find occupation for their inquietude. The natural disposition of Henry sufficiently inclined him to follow this advice, and the civil disorders of France gave him the fairest prospect of success. Accordingly, in 1415, ¹⁹⁸ France invaded. the king invaded France at the head of 30,000 men. The great progress he made there is related at length under the article FRANCE. He had espoused the king's daughter, and conquered the greatest part of the kingdom. His queen was delivered of a son named *Henry*, whose birth was celebrated by the greatest rejoicings both at London and Paris; and the infant prince seemed to be universally regarded as heir to both monarchies. But Henry's glory, when it seemed to be approaching the summit, was blasted at once by death, and all his mighty projects vanished. He was seized with a fistula, a distemper which at that time the physicians had not skill enough to cure; and he expired on the 31st ¹⁹⁹ Death of of August 1422, in the 34th year of his age, and the Henry V. 10th of his reign.

Henry VI. succeeded to the throne before he was ²⁰⁰ Henry VI. quite a year old, and his reign affords only the most dismal accounts of misfortunes and civil wars. His relations very soon began to dispute about the administration during the minority. The duke of Bedford, one of the most accomplished princes of the age, was appointed by parliament protector of England, defender of the church, and first counsellor to the king. His brother, the duke of Gloucester, was fixed upon to govern in his absence, while he conducted the war in France; and in order to limit the power of both brothers, a council was named, without whose advice and approbation no measure could be carried into execution.

The kingdom of France was now in the most desperate situation. The English were masters of almost the whole of it. Henry VI. though but an infant, was solemnly invested with regal power by legates from Paris; so that Charles VII. of France succeeded only to a nominal kingdom. With all these great advantages, however, the English daily lost ground; and in the year 1450 were totally expelled from France*. It * See would easily be imagined, that such a train of bad success ^{France.} would produce discontents among the rulers at home. The duke of Gloucester was envied by many on account of his high station. Among these was Henry Beaufort, bishop of Winchester, great uncle to the king, and the legitimate son of John of Gaunt brother to Richard II. The prelate, to whom the care of the king's education had been committed, was a man of great capacity and experience, but of an intriguing and dangerous disposition. He had frequent disputes with the duke of Gloucester, over whom he gained several advantages on account of his open temper. The duke of Bed-

^{England.} ford employed both his own authority and that of parliament to reconcile them, but in vain; their mutual animosities served for several years to embarrass government, and to give its enemies every advantage. The sentiments of the two leaders were particularly divided with regard to France. The bishop laid hold of every prospect of accommodation with that country; and the duke of Gloucester was for maintaining the honour of the English arms, and regaining whatever had been lost by defeats or delay. Both parties called in all the auxiliaries they could. The bishop resolved to strengthen himself by procuring a proper match for Henry, at that time 23 years old; and then bringing over the queen to his interests. Accordingly, the earl of Suffolk, a nobleman whom he knew to be steadfast in his attachments, was sent over to France, apparently to settle the terms of a truce which had then been begun, but in reality to procure a suitable match for the king.

²⁰¹
Married to
Margaret
of Anjou.

The bishop and his friends had cast their eyes on Margaret of Anjou, daughter of Regnier, titular king of Sicily, Naples, and Jerusalem; but without either real power or possessions. She was considered as the most accomplished princess of the age, both in mind and person; and it was thought would, by her own abilities, be able to supply the defects of her husband, who appeared weak, timid, and superstitious. The treaty was therefore hastened on by Suffolk, and soon after ratified in England. The queen came immediately into the bishop's measures: Gloucester was deprived of all real power, and every method taken to render him odious to the public. One step taken for this purpose was to accuse his duchess of witchcraft. She was charged with conversing with one Roger Bolingbroke, a priest and reputed necromancer; and also with one Mary Gourdmain, who was said to be a witch. It was asserted that these three in conjunction had made an image of the king in wax, which was placed before a gentle fire: and as the wax dissolved, the king's strength was expected to waste; and upon its total dissolution, his life was to be at an end. This accusation was readily believed in that superstitious age. The prisoners were pronounced guilty; the duchess was condemned to do penance and suffer perpetual imprisonment; Bolingbroke the priest was hanged, and the woman burnt in Smithfield.

²⁰²
Duke of
Gloucester
murdered.

The bishop, called also the *Cardinal*, of Winchester, was resolved to carry his resentment against Gloucester to the utmost. He procured a parliament to be summoned, not at London, which was too well affected to the duke, but at St Edmundsbury, where his adherents were sufficiently numerous to overawe every opponent. As soon as Gloucester appeared, he was accused of treason and thrown into prison; and on the day on which he was to make his defence, he was found dead in his bed, though without any signs of violence upon his body.

The death of the duke of Gloucester was universally ascribed to the cardinal of Winchester, who himself died six weeks after, testifying the utmost remorse for the bloody scene he had acted. What share the queen had in this transaction, is uncertain: but most people believed that without her knowledge the duke's enemies durst not have ventured to take away his life. The king himself shared in the general ill-will, and he

never had the art to remove the suspicion. His incapacity also began every day to appear more clearly, and a pretender to the throne soon made his appearance. ^{England.}

In the year 1450, Richard duke of York began to think of preferring his claims to the crown. All the males of the house of Mortimer were extinct; but Anne, the sister of the last earl of March, having espoused the earl of Cambridge, who had been beheaded for treason in the reign of Henry V. had transmitted her latent, but not yet forgotten claim, to her son Richard. This prince, descended by his mother from Philippa, only daughter of the duke of Clarence, second son of Edward III. stood plainly in order of succession before the king; who derived his descent from the duke of Lancaster, third son of that monarch. The duke was a man of valour and abilities, as well as of some ambition; and he thought the weakness and unpopularity of the present reign afforded a favourable opportunity to assert his title. The ensign of Richard was a white rose, that of Henry a red one; and this gave names to the two factions, who were now about to drench the kingdom in blood.

After the cardinal of Winchester's death, the duke of Suffolk, who also had been concerned in the assassination of Gloucester, governed every thing with uncontrollable sway. His conduct soon excited the jealousy of the other nobility, and every odious or unsuccessful measure was attributed to him. The duke, however, imagining that his crimes were of such a nature as could not be proved, boldly called upon his enemies to show an instance of his guilt. The house of commons immediately opened against him a charge of corruption, tyranny, and treason. He was accused of being the cause of the loss of France; of persuading the French king, with an armed force, to invade England; and of betraying the secrets of state. The popular resentment against him was so strong, that Henry, in order to secure him as much as possible, sentenced him to five years banishment. This was considered by his enemies as an escape from justice. The captain of a ship was therefore employed to intercept him in his passage to France. He was seized near Dover, his head struck off on the side of a long-boat, and his body thrown into the sea. ²⁰⁵ And mur- dered.

The complaints against Henry's government were heightened by an insurrection headed by one John Cade, a native of Ireland. He had been obliged to fly over into France for his crimes: but, on his return, seeing the people prepared for violent measures, he assumed the name of *Mortimer*; and, at the head of 20,000 Kentish men, advanced towards Blackheath. The king sent a message to demand the cause of their rising in arms. Cade in the name of the community answered, That their only aim was to punish evil ministers, and procure a redress of grievances for the people. On this a body of 15,000 troops was levied; and Henry marched with them in person against Cade, who retired on his approach, as if he had been afraid of coming to an engagement. He lay in ambush, however, in a wood; not doubting but he should be pursued by the king's whole army: but Henry was content with sending a detachment after the fugitives, and returned to London himself; upon which Cade issued from his ambuscade, and cut the detachment in pieces. ²⁰⁶ Insurrec- tion of John Cade. ^{Soon}

England. Soon after, the citizens of London opened their gates to the victor; and Cade, for some time, maintained great order and regularity among his followers. He always led them out into the fields in the night-time, and published several edicts against plunder and violence of any kind. He was not, however, long able to keep his people in subjection. He beheaded the treasurer Lord Say, without any trial; and soon after, his troops committing some irregularities, the citizens resolved to shut their gates against him. Cade endeavouring to force his way, a battle ensued, which lasted all day, and was ended only by the approach of night. The archbishop of Canterbury, and the chancellor, who had taken refuge in the tower, being informed of the situation of affairs, drew up, during the night, an act of amnesty, which was privately dispersed among the rebels. This had such an effect, that in the morning Cade found himself abandoned by his followers; and retreating to Rochester, was obliged to fly alone into the woods. A price being set on his head by proclamation, he was discovered and slain by one Alexander Eden; who, in recompense for this service, was made governor of Dover castle.

207
Duke of
York sus-
pected by
the court.

The court now began to entertain suspicions that the insurrection of John Cade had not happened merely in consequence of his own machinations and ambition, but that he had been instigated thereto by the duke of York, who, as we have already seen, pretended a right to the crown. As he was about this time expected to return from Ireland, and a report took place that he was now to assert his supposed right by force of arms, orders were issued in the king's name to deny him entrance into England. This was prevented by his appearing with no more than his ordinary attendants; but though he thus escaped the danger for the present, he instantly saw the necessity of proceeding in support of his claim. His partizans were instructed to distinguish between his right by succession and by the laws of the kingdom. The adherents of Lancaster maintained, that though the advancement of Henry IV. might be looked upon as irregular, yet it was founded upon general consent; or, even allowing it to have been at first invalid, it had now been for a long time established, and acquired solidity of consequence; nor could the right of succession at any rate be pleaded for the purpose of overthrowing the general peace and tranquillity of the kingdom. The principles of liberty as well as the maxims of true policy had been injured by the house of York; while the public were bound to those of Lancaster, no less by political than moral duty, in consequence of the oaths of fealty that had been so often sworn to them; the duke of York himself having repeatedly sworn allegiance to them, and thus indirectly renounced those claims which he now brought forward to disturb the public tranquillity. On the part of the duke of York, it was replied, that the good of the people required the maintenance of order in the succession of princes; that, by adhering constantly to this rule, a number of inconveniences would be prevented which must otherwise ensue; and though that order had been broken through in the case of Henry IV. it was never too late to remedy any pernicious precedent. It would indeed be a great encourage-

208
Arguments
for and a-
gainst the
houses of
York and
Lancaster.

ment to usurpers, if the immediate possession of power, or their continuance in it for a few years, could convert them into legal princes; and the people must be in a very miserable situation, if all restraints on violence and ambition were taken off, and full liberty given to every innovator to make what attempts he pleased. They did not indeed deny that time might confer solidity on a government originally founded in usurpation; but a very long course of years was not only required for this purpose, but a total extinction of those who had any just title. The deposition of Richard II. and advancement of Henry IV. were not legal acts, but the effects of mere levity in the people; in which the house of York had acquiesced from necessity, and not from any belief of the justice of their cause; nor could this be ever interpreted into any renunciation of their pretensions; neither could the restoration of the true order of succession be considered as an encouragement to rebellion and turbulence, but the correction of a former abuse by which rebellion had been encouraged. Besides, the original title of Henry IV. was founded entirely on present convenience; and even this was now entirely shifted to the house of York. The present prince was evidently incapable of governing the kingdom by reason of his imbecility; so that every thing was governed either by corrupt ministers or an imperious queen, who engaged the nation in foreign connections entirely contrary to its interests; while, on the other hand, the true heir of the crown was a prince of approved judgment and experience, and a native of England, who, by his restoration, would undoubtedly correct all those abuses of which there was now such just reason to complain.

In this dispute it was evident that the house of York had the better in point of argument: nevertheless, as a prince of the house of Lancaster was in immediate possession of the throne, and could by no means be charged with any crime, the cause of the former was less generally interesting; especially as it must always have been uncertain, *à priori*, whether the duke of York would have governed any better than King Henry. After his return from Ireland, however, the former used all his power and influence to foment the disorders which had for some time prevailed in the kingdom; and the conduct of the next parliament manifested the success of his intrigues. A violent attack was made upon such noblemen as were known to be most in favour with the king. The house of commons presented a petition against the duke of Somerset, the dukes of Suffolk, the bishop of Chester, Lord Dudley, and several others of inferior rank; praying not only that the king would remove them from his council, but that he would prohibit them from coming within twelve miles of the court. Henry, not daring to refuse this petition altogether, consented to banish all those of inferior rank, whom the commons had specified, but only for a year; and this too on condition that he had no use for their assistance in quelling any rebellion. But he rejected a bill for attainting the late duke of Suffolk, and proposed some other measures which seemed to militate against the court, though it had passed both the house of lords and the house of commons.

209
The duke
of York
foments
dissensions
between
the king
and parlia-
ment.

Encouraged by this disagreement between Henry
and

England.

210
Richard
raises an
army;

211
But is obli-
ged to re-
tire.

212
He is ap-
pointed
protector
in conse-
quence of
the king's
illness.

213
Is deposed
and levies
an army.

214
History of
the civil
war be-
tween Hen-
ry and the
duke of
York.

and his parliament, the duke of York raised an army of 10,000 men, with whom he marched towards London, demanding a reformation in matters of government, and the removal of the duke of Somerset. This first enterprize, however, proved unsuccessful; the gates of the city were shut against him, and he was pursued by the king at the head of a superior army. On this he retired into Kent; and as there was a number of his own friends in the army of the king, a conference took place, in which Richard still insisted upon the removal of the duke of Somerset, and his submitting to be tried in parliament. This request, was in appearance complied with, and Somerset arrested: the duke of York was then persuaded to wait upon the king in his royal pavilion; but, on repeating his charge against the duke, he was surpris'd to see the latter come out from behind the curtain, and offer to maintain his innocence. Richard perceiving that he had not sufficient interest to ruin his adversary, pretended to be satisfied, and retired to his seat at Wigmore in Wales; and during the time he resided there, a better opportunity was given him of accomplishing his designs than he could have hoped for. The king fell into a kind of lethargic disorder, which increased his natural imbecility to such a degree, that he could no longer retain a shadow of royalty. Richard now had interest enough to get himself appointed protector, with power to hold parliaments at pleasure; with which high office he was no sooner invested, than he turned out all the Lancastrian party from their offices, and sent the duke of Somerset to the tower; but on the recovery of the king, which happened in no long time after, he himself was dismissed from his employment, the duke of Somerset released, and the administration once more put into his hands. On this the duke of York levied an army, merely as he pretended, to enforce the reformation of government and the removal of the duke of Somerset. Thus Henry, though sore against his will, was obliged to face him in the field. A battle ensued at St Alban's; in which the royalists were defeated, and the duke of Somerset, the chief partizan of their cause, killed in the action. The king himself was wounded, and took shelter in a cottage near the field of battle; where he was taken prisoner, but was afterwards treated with great respect and kindness by the duke of York.

Henry, though he was now only a prisoner treated with the forms of royalty, was nevertheless pleas'd with his situation; but his queen, a woman of a bold and masculine spirit, could not bear to have only the appearance of authority, while others enjoyed all the real power. She therefore excited the king once more to assert his right by force of arms; and after several manœuvres, the duke of York was obliged to retire from court. A negotiation for peace was at first set on foot, but the mutual distrusts of both parties soon broke it off. The armies met at Bloreheath on the borders of Staffordshire, on the 23d of September 1459; and the Yorkists at first gained some advantages. But when a more general engagement was about to ensue, a body of veterans who served under the duke of York deserted to the king; and this so intimidated the duke's party, that they separated the next day without striking a blow. The

duke of York fled to Ireland; and the earl of Warwick, one of his ablest and best supporters, escap'd to Calais, with the government of which he had been entrusted during the late protectorship.

The York party, though thus in appearance suppress'd, only waited a favourable opportunity of retrieving their affairs. Nor was this opportunity long wanting. Warwick having met with some successes at sea, landed in Kent; and being there joined by other barons, march'd up to London amidst the acclamations of the people. The city immediately open'd its gates to him, and he soon found himself in a condition to face the royal army. An engagement ensued at Northampton on the 10th of July 1460; in which the royalists were entirely defeated, and the king again taken prisoner. The duke of York then openly laid claim to the crown; and on this occasion the first instance of a spirit of national liberty is said to have appear'd in the house of lords. The cause of Henry and the duke of York was solemnly debated; and the latter, though a conqueror, did not absolutely gain his cause. It was determin'd that Henry should possess the throne during his life; and that the duke of York should be appointed his successor, to the utter exclusion of the prince of Wales, who was then a child.

Though the royal party now seem'd destitute of every resource, the queen still retain'd her intrepidity. She fled into Wales, where she endeavour'd to raise another army. The northern barons, provok'd at the southern ones for settling the government and succession to the crown without their consent, soon furnish'd her with an army of 20,000 men. Another battle was fought near Wakefield Green, on the 24th of December 1460. The Yorkists were defeated, and the duke himself was killed in the action. His head was afterwards cut off by the queen's orders, and fix'd on one of the gates of York, with a paper-crown, in derision of his pretended title. His son the earl of Rutland, a youth of 17, was taken prisoner, and killed in cold blood by Lord Clifford, in revenge for his father's death, who had fallen in the battle of St Alban's.

After this victory, Margaret march'd towards London, in order to set the king at liberty; but the earl of Warwick, who now put himself at the head of the Yorkists, led about the captive king, in order to give a sanction to his proceedings. He engag'd the queen's forces at St Alban's; but through the treachery of Lord Lovelace, who desert'd during the heat of the engagement with a considerable body of forces, Warwick was defeated, and the king fell once more into the hands of his own party.

The submission of the city of London seem'd now to be the only thing wanting to complete the queen's success; but Warwick had secur'd it in his interests, and the citizens refus'd to open their gates to the queen. In the mean time, young Edward, eldest son of the late duke of York, put himself at the head of his father's party. He was now in the bloom of youth, remarkable for the beauty of his person and his bravery, and was a great favourite of the people. He defeated Jasper Tudor earl of Pembroke, at Mortimer's cross in Herefordshire. The earl himself was taken prisoner, and immediately beheaded by Edward's orders.

England.

215
Duke of
York kills
ed.

England. ders. After this, he advanced to London; and being
 216 joined by the remainder of Warwick's army, he soon
 Edward IV. obliged Margaret to retire, entered the city amidst the
 acclamations of the people, and was crowned king on
 the 5th of March 1461.

217
 Affairs of
 the queen
 totally
 ruined.

Notwithstanding all her misfortunes, however, Margaret still continued undaunted. She retired to the north, where she was soon joined by such numbers, that her army amounted to 60,000 men. She was opposed by young Edward and Warwick at the head of 40,000; and both armies met near Toton in the county of York, on the 29th of March 1461. A bloody battle ensued, in which the queen's army was totally defeated; and as Edward, prompted by his natural cruelty, had ordered no quarter to be given, 40,000 of the Lancastrians were slain in the field or in the pursuit. Edward is said to have gained this victory by means of a violent storm of snow, which blew full in the face of the queen's army, and so blinded them that they could scarcely make any use of their arms. After this disaster the queen fled to Scotland with her husband and son; and notwithstanding all the misfortunes she had already met with, resolved once more to enter England at the head of 5000 men granted her by the king of France. But even here she was attended by her usual bad fortune. Her little fleet was dispersed by a tempest, and she herself escaped with the utmost difficulty by entering the mouth of the Tweed. Soon after, a defeat, which her few forces sustained at Hexham, seemed to render her cause entirely desperate; and the cruelties practised upon all her adherents rendered it very dangerous to befriend her.

218
 Adventures
 of the king
 and queen.

By these repeated misfortunes the house of Lancaster was so effectually ruined, that Margaret was obliged to separate from her husband, and both of them to shift for themselves the best way they could. The king was still protected by some of his friends, who conveyed him to Lancashire, where he remained in safety for a twelvemonth; but being at last discovered, he was thrown into the Tower and kept close prisoner. The queen fled with her son to a forest, where she was set upon by robbers, who stripped her of her rings and jewels, treating her otherwise with the utmost indignity. A quarrel which happened among them about the division of the spoil afforded her an opportunity of escaping from their hands into another part of the forest, where she wandered for some time without knowing what to do. At last, when quite spent with hunger and fatigue, she saw a robber coming up to her with a drawn sword in his hand. Finding it altogether impossible to escape, she suddenly took the resolution of putting herself under his protection. Advancing towards him, therefore, and presenting the young prince, "Here (says she), my friend, I commit to your care the safety of your king's son." This address so much surprised the robber, that, instead of offering her any injury, he professed himself entirely devoted to her service. After living for some time concealed in the forest, she was at last conducted to the sea-side, where she found a ship which conveyed her to Flanders. On her arrival there, she went to her father's house, who, though very poor, gave her such entertainment as he could afford; and in this retreat she staid some years in expectation of finding an opportunity of retrieving her affairs.

219
 The queen
 retires to
 Flanders.

Edward, in the mean time, thinking himself securely fixed on the throne, gave a loose to his favourite passions; one of which was an immoderate love of women. To divert him from this, the earl of Warwick, to whom he was indebted for his crown, advised him to marry. Edward consented, and sent him over to the continent to negotiate a match with the princess of Savoy. The negotiation proved successful; but, in the mean time, the king had privately espoused Elizabeth Woodville, daughter to Sir Philip Woodville, who had married the duchess of Bedford after the death of her first husband. Edward had employed his arts of seduction against this lady in vain before he married her; but unfortunately the match was concluded just at the time that the earl of Warwick had proved successful in his negotiation with the princess of Savoy. The minister therefore returned full of indignation against his sovereign: and Edward, forgetting how great cause he had to be offended, determined to remove him entirely from his councils. Warwick was likewise disgusted by the favour shown to the queen's party; which, though certainly a piece of very commendable policy in Edward, was entirely disagreeable to the ambitious disposition of that nobleman. A plan of revenge was therefore thought of; and a most powerful combination was formed against Edward: to accomplish which, Warwick not only employed his own influence, which was very extensive, but likewise that of the duke of Clarence, Edward's brother, to whom the earl had allied himself by giving him his daughter in marriage; after which he persuaded him to embrace his cause. Some circumstances which took place about this time also favoured the scheme. The inhabitants about St Leonard's in Yorkshire complained, that the duties levied for that institution, and which had been originally appointed for pious purposes, were secreted by the managers, who refused to contribute their part. As the clergy were concerned in this affair, they attempted to silence their antagonists by ecclesiastical fulminations against them; upon which the latter took up arms, fell upon the officers of the hospital, and having massacred them, proceeded towards York, to the number of 15,000. In the first skirmish, they had the misfortune to lose their leader, who was instantly executed. The rebels, however, still continued in arms, and in a short time appeared in such numbers as to become formidable to government. Henry earl of Pembroke was sent against them with a body of 5000 men; and having taken Sir Henry Nevil, one of the leaders of the insurgents, prisoner, instantly put him to death; but this was soon revenged by a similar execution on himself, who happened to be defeated and taken prisoner a short time after. This defeat had been occasioned by a disagreement betwixt the earls of Pembroke and Devonshire; in consequence of which the latter had gone off with his troops, leaving Pembroke to shift for himself the best way he could. The king, enraged at this, caused Devonshire to be executed in a like summary manner: but this was of no service to his cause; a new body of insurgents appeared under Sir Robert Welles, son to a nobleman of that name. The latter, in order to secure himself from all suspicions of disloyalty, fled to a monastery; but he was soon enticed from thence and put to death by the insidious promises of King Edward, whose treachery was equal to his cruelty. His

England.
 220
 Warwick
 disgusted by
 Edward.

221
 The king's
 brother
 joins in the
 conspiracy
 against him.

220
 An insur-
 rection in
 Yorkshire.



England.

son soon after shared the same fate, being defeated and taken prisoner by Edward, who instantly ordered him to be beheaded, along with Sir Thomas Launde and other persons of distinction.

223
Warwick
and Clarence
join the insur-
gents.

Notwithstanding such an appearance of a general insurrection, the king had so little suspicion of the loyalty of Warwick and Clarence, that he employed them in raising troops to quell the insurgents. Instead of executing their commission with fidelity, however, they joined the malecontents with all the forces they could raise; but being quite disconcerted by the defeat and death of Sir Robert Welles, they retired to Lancashire, in hopes of being joined by Lord Stanley, who had married the earl of Warwick's sister. Being disappointed in this, they were obliged to disband their army, and fly into Devonshire, whence they set sail for Calais. Upon their arrival on the continent, matters seemed not to be much mended: the deputy-governor, whom Warwick had left, refused him admittance; nor would he even allow the duchess of Clarence to land, though she had been delivered of a son on board only a very few days before, and was at that time extremely ill. Being well acquainted, however, with the uncertainty of the affairs of England at that time, he afterwards made an apology to Warwick for this behaviour. The latter pretended to be easily reconciled; but immediately left the place, having seized some Flemish vessels which he found lying in the neighbourhood.

224
Reconcilia-
tion be-
twixt War-
wick and
the queen.

As a very close alliance subsisted between Warwick and the duke of Burgundy, the king of France became uneasy; and therefore, as soon as the earl landed in his dominions, received him with the greatest marks of esteem. The reconciliation betwixt him and the unfortunate Queen Margaret now seemed to be natural, though, considering all circumstances, this must have formerly appeared in a manner impossible. The earl's father had been put to death by the orders of Margaret; and Warwick, in return, had twice taken prisoner King Henry, banished the queen, and put to death almost all their faithful adherents. By the mediation of the French monarch, however, all differences were accommodated. A fleet was prepared to reconduct them to England; and seizing a proper opportunity, they landed at Dartmouth with a small body of troops, while Edward was in the north suppressing an insurrection which had lately appeared there. Warwick was attended with astonishing success on his arrival in England, and in less than six days saw himself at the head of 60,000 men. Edward was now obliged in his turn to fly the kingdom. Having narrowly escaped an attempt made upon his person by the marquis of Montague, he embarked on board a small fleet which lay off Lynn in Norfolk. While at sea, he was chased by some ships belonging to the Hans Towns that were then at war both with France and England; but at length, having escaped all dangers, Edward landed safely in Holland, where he met with but an indifferent reception from the duke of Burgundy, with whom he had lately entered into an alliance.

225
He lands
in Eng-
land.

Warwick in the mean time advanced to London, and once more released and placed on the throne the miserable king Henry VI. A parliament was called, which very solemnly confirmed Henry's title to the throne, and Warwick himself was dignified by the people with the title of the *king-maker*. All the at-

tainers of the Lancastrians were revered; and every one was restored who had lost either honours or fortune by his former adherence to Henry's cause. All the adherents of Edward fled to the continent, or took shelter in monasteries, where they were protected by the ecclesiastical privileges. But Edward's party was not yet destroyed. After an absence of nine months, being seconded by a small body of troops granted him by the duke of Burgundy, he made a descent at Ravenspur in Yorkshire. At first he met with little success; but his army increasing on his march, he was soon in a condition to appear before the capital, which immediately opened its gates.

England.

The unfortunate Henry was thus again plucked from the throne; and the hopes of Warwick were almost totally blasted by the defection of Clarence, Edward's brother. Nothing now remained but to come to an engagement as soon as possible. Warwick knew his forces to be inferior to those of Edward, but placed great dependence on his own generalship. He therefore advanced to Barnet, within ten miles of London, where he resolved to wait the coming of Edward. The latter soon came up with him, and on the 14th of April 1471 a most obstinate and bloody battle was fought. Edward, according to custom, had ordered no quarter to be given; and obtained the victory through a mistake of a body of Warwick's forces, who fell with fury on their own party instead of the enemy. The earl himself was slain, together with his brother, and 10,000 of his bravest followers.

The queen was just then returned with her son from France, where she had been soliciting supplies. She had scarce time to refresh herself from the fatigues of the voyage, when she received the fatal news of the death of Warwick, and the total destruction of her party. All her resolution was not able to support her under such a terrible disaster. Her grief now for the first time, it is said, manifested itself by her tears; and she immediately took sanctuary in the abbey of Beaulieu in Hampshire. Here she still found some friends willing to assist her. Tudor earl of Pembroke, Courtney earl of Devonshire, the lords Wenlock and St John, with some other men of rank, encouraged her yet to hope for success, and promised to stand by her to the last. On this assurance, she resumed her courage; and advancing through the counties of Devon, Somerset, and Gloucester, increased her army every day. At last, however, she was overtaken by Edward with his victorious army at Tewkesbury, on the banks of the Severn. The queen's army was totally defeated; the earl of Devonshire and Lord Wenlock were killed in the field; the duke of Somerset, and about 20 other persons of distinction, who had taken shelter in a church, were surrounded, dragged out, and immediately beheaded; about 3000 of their party fell in battle, and the army was entirely dispersed. Queen Margaret and her son were taken prisoners, and brought to the king, who asked the prince in an insulting manner, how he dared to invade his dominions? The young prince replied, that he came thither to claim his just inheritance; upon which Edward struck him on the face with his gauntlet. The dukes of Clarence and Gloucester, Lord Hastings, and Sir Thomas Gray, taking this blow as a signal for farther violence, hurried the prince into the next apartment, and there dispatched him with their

226
Total de-
struction of
the queen's
party.

England. their daggers. Margaret was thrown into the tower along with her husband Henry, who expired in that confinement a few days after. It was universally believed that he was murdered by the duke of Gloucester, though of this there was no direct evidence. Margaret was ransomed by the king of France for 50,000 crowns, and died a few years after in a most miserable situation.

Edward being now freed from all his enemies, began to inflict punishment on those who had formerly appeared against him. Among the cruelties he committed, that on his brother the duke of Clarence was the most remarkable. The king happening to be one day hunting in the park of Thomas Burdet, a servant of the duke, killed a white buck which was a great favourite of the owner. Burdet, vexed at the loss, broke out into a passion, and wished the horns of the deer in the belly of the person who advised the king to that insult. For this exclamation Burdet was tried for his life, and executed at Tyburn. The duke of Clarence exclaimed against the iniquity of this sentence; upon which he was arraigned before the house of peers, found guilty, and condemned to death. The only favour granted him was to have the choice of his death; and his choice was a very singular one, namely, to be drowned in a butt of Malmsey wine; which was accordingly done.—The rest of this reign affords little else than a history of the king's amours. Among his many mistresses, Jane Shore was the most remarkable; (see SHORE). The king died on the 9th of April 1482, in the 42d year of his age, and 21st of his reign, counting from his first assuming the crown. Besides five daughters, he left two sons; Edward prince of Wales, his successor, then in his 13th year; and Richard duke of York in his 9th.

228
Edward V.

On the death of Edward IV. the kingdom was divided into new factions. The queen's family, which, during the last reign, had come into power, was become obnoxious to the old nobility, who considered them as their inferiors. The king had endeavoured to prevent these animosities from coming to a height, by desiring on his death-bed that his brother Richard duke of Gloucester should be entrusted with the regency; and recommended peace and unanimity during the minority of his son. But the king was no sooner dead than the former resentment between these parties broke out with violence; and the duke of Gloucester, who was endued with almost every bad quality, resolved to profit by their contentions. His first step was to get himself declared protector of the realm; and having arrested the earl of Rivers, the king's uncle and guardian, he met young Edward in his way from Ludlow castle, where the late king had resided during the latter part of his reign, and respectfully offered to conduct him to London. Having thus secured the person of the king, he next got possession of his brother's person also. The queen had retired with this child into Westminster abbey; and it was not without extreme regret that she delivered him up at the intercession of the primate and archbishop of York.

229
Duke of
Gloucester
declared
protector.

In a few days after Gloucester had made himself master of the persons of the two princes, he had them confined in the tower, under pretence of guarding them from danger; and soon after spread reports of their illegitimacy, and by pretended obstacles put off the

young king's coronation. Lord Stanley first began to suspect his designs; and communicated his suspicions to Lord Hastings, who had long been firmly attached to the king's family. Lord Hastings would not at first give credit to this surmise; but he very soon had a fatal proof of the truth of what had been communicated to him. On the 13th of June 1483, he was hurried out of the council-room in the tower by Gloucester's order, and beheaded on a log of timber. The soldiers who carried him off made a bustle as though an attempt had been made to rescue him, and one of them discharged a blow at Lord Stanley's head with a pole-axe; but he happily escaped by shrinking under the table. The same day were executed the Earl Rivers, and some others, who had committed no other crime than being faithful to the young king.

The protector now thought he might with safety lay claim to the throne. He had previously gained over the duke of Buckingham, a nobleman of great influence among the people. He used his utmost endeavours to inspire the people with a notion of the illegitimate birth of the late king, and consequently of his children. Dr Shaw, a popular preacher, was also hired to harangue the people to the same purpose from St Paul's cross. Having expatiated on the incontinence of the queen, and the illegality of the young king's title, he then made a panegyric on the virtues of the protector. "It is the protector (continued he) who carries in his face the image of virtue, and the marks of a true descent. He alone can restore the lost glory and honour of the nation." It was hoped that upon this occasion some of the populace would have cried out, "Long live King Richard!" but the audience remaining silent, the duke of Buckingham undertook in his turn to persuade them. Having expatiated on the calamities of the last reign and the illegitimacy of the present race, he told the people, that he saw only one method of warding off the miseries which threatened the state, which was by electing the protector; but he seemed apprehensive that he would never be prevailed upon to accept a crown accompanied with such difficulty and danger. He next asked his auditors, whether they would have the protector for their king? but was mortified to find that a total silence ensued. The mayor, who was in the secret, willing to relieve him in this embarrassed situation, observed, that the citizens were not accustomed to be harangued by a man of his quality, and would only give an answer to his recorder. This officer, therefore, repeated the duke's speech; but the people continuing still silent, "This is strange obstinacy (cried the duke): we only require of you, in plain terms, to declare, whether or not you will have the duke of Gloucester for your king; as the lords and commons have sufficient power without your concurrence? At this, some of the meanest apprentices, incited by the servants of the protector and Buckingham, raised a feeble cry of "God save King Richard!" The mob at the door repeated the cry; and throwing up their caps into the air, cried out, "A Richard! A Richard!" After this farce was acted, Buckingham, on the 24th of June 1483, waited on Richard with offers of the crown: but the protector, with hypocritical modesty, at first declined the offer; till being told, that the people, in case of his refusal, must look out for one that would be more compliant, he

England.

^{England.} he accepted the government of England and France, with a resolution, as he said, to defend the one and subdue the other.

²³⁰ Richard III. The first step taken by the new king was to send orders to Sir Robert Brackenbury governor of the tower, to put the young princes to death. But this he refused; and submissively answered that he knew not how to embue his hands in innocent blood. A fit instrument for this purpose, however, was not long wanting. Sir James Tyrrel readily undertook the office; and Brackenbury was ordered to resign the keys to him for one night. Tyrrel choosing three associates, Slater, Deighton, and Forest, came in the night-time to the door of the chamber where the princes were lodged; and sending in the assassins, bid them execute their commission, while he himself staid without. They found the young princes in bed, and fallen into a sound sleep. The assassins smothered them with the bolster and pillows; after which they showed their naked bodies to Tyrrel, who ordered them to be buried at the stair-foot under a heap of stones (c).

²³¹ Edward V. and his brother murdered.

Richard having thus secured himself on the throne by the most iniquitous methods, attempted to strengthen his interest by foreign alliances, and procuring the favour of the clergy at home by great indulgences; but he found his power threatened from a quarter where he least expected an attack. The duke of Buckingham, who had been so instrumental in raising him to the throne, did not think himself properly rewarded. He made a demand of some confiscated lands in Hereford, to which his family had an ancient claim. Richard either reluctantly complied with his request, or only granted it in part; so that a coolness soon ensued between them, and in a little time Buckingham came to a resolution of dethroning the monarch whom he had just raised. For some time he remained in doubt, whether he should assume the crown himself or set up another. At length he determined on the latter; and resolved to declare for Henry earl of Richmond, who was at that time an exile in Brittany, and was considered as the only surviving branch of the house of Lancaster. He was one of those who had the good fortune to escape the numerous massacres of the former reigns; but as he was a descendant of John of Gaunt by the female line, he was for that reason obnoxious to those in power. He had long lived in exile, and was once delivered over to the ambassadors of Edward IV. who were preparing to carry him to England; when the duke of Brittany, who delivered him, repented of what he had done, and took him from the ambassadors just as they were carrying him on ship-board. His right to the crown by succession was very doubtful: but the cruel behaviour of Richard inclined the people in general greatly to favour him; and, to give an additional strength to his title, a match was projected betwixt him and the princess Elizabeth, the eldest daughter of Edward IV. which, by uniting the two rival families, would put an end to those dissen-

²³² Buckingham determines to support the claim of the earl of Richmond to the throne.

sions which had so long filled the kingdom with bloodshed and confusion. Richard, in the mean time, from some reasons which have not been particularized by historians, began to entertain doubts of the fidelity of Buckingham, and determined to cut him off. For this purpose he sent for him to court: but Buckingham, instead of obeying the summons, fled into Wales, where he raised a considerable army, and forthwith set out to the eastward with a design to invade England. Richard hastened to meet him with what forces he could raise; but the march of Buckingham being retarded by a most uncommon inundation of the Severn which lasted 10 days, his troops were so disheartened at this event, that they almost all deserted him. The duke was therefore obliged to fly in distress, and Richard instantly set a price upon his head. Buckingham was now obliged to trust his life in the hands of an old servant of his own, named *Banister*; but this man, tempted by the greatness of the reward, betrayed him to the sheriff of Shropshire, by whom he was seized and conducted to Richard at Salisbury, who caused him to be executed without delay. The earl of Richmond, in the mean time, had set sail from St Maloes with a body of 5000 men: but after his arrival in England, receiving the disagreeable news of Buckingham's misfortune, he set sail again for Bretagne; while Richard, emboldened by the bad success of his enemies, determined to confirm his title to the throne by calling a parliament, which till this time he had not ventured to do. At present matters were so circumstanced, that the parliament had no other resource than to comply with his desires, and acknowledge his right to the crown. An act was passed confirming the illegitimacy of Edward's children; and an attainder was also confirmed against the earl of Richmond; the duties of tonnage and poundage were granted to the king for life; and his only son Edward, then about 12 years of age, was created prince of Wales. In return for these concessions, Richard passed several popular laws, particularly against the extorting of money by benevolences, and some others calculated to gain the good will of the opposite party. He paid his court also to the queen-dowager with such assiduity and success, that she left her sanctuary, and put herself and her daughters into his hands. The ambition and cruelty of this man indeed are said to have extinguished every sentiment of natural affection as well as humanity. He had married Anne, the second daughter of the earl of Warwick, and widow of Edward prince of Wales, whom he himself had murdered; but having born him but one son, who died about this time, he considered her as an invincible obstacle to the accomplishment of his desires; for which reason it was thought he put an end to her life by poison: and as he knew that the projected match between the earl of Richmond and the princess Elizabeth could only make the rivalship of the former any way formidable, he resolved to obtain a dispensation

^{England.}

²³³ He takes up arms, but is abandoned by his army and death.

²³⁴ Richmond lands in England, but is obliged to return.

²³⁵ Richard's title confirmed by parliament.

(c) These circumstances are said to have been confessed in the succeeding reign, though the perpetrators escaped punishment. The bodies of the two princes were sought for without any success under the reign of Henry VII. but in the time of Charles II. the bones of two persons answering to their age were found in the spot where they were said to have been buried; which, being supposed to be the remains of these two unfortunate youths, they were buried under a marble monument in Westminster abbey.

England. tion from the pope for marrying her himself. The queen-dowager is even said to have come into this scheme, with a view to recover her power; but the princess herself always rejected his addresses with abhorrence. The refusal of the princess occasioned no small perplexity in Richard; and before he could determine on any proper method of accomplishing his purpose, he received news of Richmond's preparations for landing in England. These being soon accomplished, Henry set sail from Harfleur in Normandy, and landed without opposition, on the 17th of August 1485, at Milford haven in Wales. Richard, in the mean time, not knowing where the invasion was to take place, had posted himself at Nottingham; which being almost in the centre of the kingdom, was therefore proper for resisting any invader. Sir Rice ap Thomas and Sir Walter Herbert were commissioned by Richard to oppose his rival in Wales; but the former immediately deserted to him, and the latter made but a very feeble resistance. Richard instantly resolved to meet his antagonist, and to risk every thing on the event of a battle. Richmond, though he had not above 6000 men, and the king near double that number, did not decline the combat; being chiefly encouraged by the promises of Lord Stanley to join him with a body of 7000 men, and with whom he hovered at a little distance from the intended field of battle, seemingly indetermined to join either side.

236
Richmond
lands in
England a
second
time.

237
Richard de-
feated and
killed.

The king having commanded his army to form themselves in order of battle, intrusted the van to the duke of Norfolk, while he himself, with the crown on his head, took the command of the main body. Lord Stanley in the mean time posted himself on one flank between the two armies, while his brother Sir William took his station directly opposite. As his intention of either joining the enemy or keeping neutral during the time of the engagement was now far from being doubtful, Richard sent him orders to join the main body; which not being complied with, the tyrant determined to put to death Stanley's son, who had been left with him as a pledge of his father's fidelity. He was persuaded, however, to defer the execution till after the engagement, that Stanley might thereby be induced to delay his purpose in joining the enemy. This, however did not answer the expectation. Soon after the engagement was begun, Stanley deserted Richard's party, and joining Richmond, entirely decided the fortune of the day. The tyrant perceiving his situation to be quite desperate, and seeing his rival at no great distance from him, drove up against him with fury, in hopes that either Henry's death or his own would decide the victory between them. He killed Sir William Brandon the earl's standard-bearer; he dismounted Sir John Cheyney; and was within reach of Richmond, when Sir William Stanley breaking in with his troops, Richard was furrounded and overwhelmed by numbers. His body was found in the field, covered with dead enemies, and besmeared with blood. It was thrown carelessly across a horse, carried to Leicester, amidst the shouts of insulting spectators, and interred in the Gray-Friars church of that place.

The usurper's crown being found on the field of battle, was placed on the head of the conqueror, while the whole army cried out, "Long live King Henry!" Two days after the battle, Henry gave orders to con-

fine Edward Plantagenet earl of Warwick, and son of the unfortunate duke of Clarence; and to release the princess Elizabeth, who had been confined in the Tower. He then advanced by slow and gradual marches to the city of London, where he was received with the greatest demonstrations of joy. He was crowned king of England on the 30th of October 1485; and to heighten the splendor on that occasion, he bestowed the rank of knights-banneret on 12 persons, and conferred peerages on three. Jasper earl of Pembroke, his uncle, he created duke of Bedford; Thomas Lord Stanley his father-in-law, earl of Derby; and Edward Courteney, earl of Devonshire. At the coronation likewise appeared a new institution, which the king had established for personal security as well as pomp; a band of 50 archers, who were denominated Yeomen of the Guard. But lest the people should take umbrage at this step, as if it implied a diffidence of his subjects, he declared the institution to be perpetual. The ceremony of the coronation was performed by Cardinal Bouchier archbishop of Canterbury.—On the 18th of January 1486, he was married to the princess Elizabeth; and his marriage was celebrated at London with greater appearance of joy than either his first entry or his coronation had been. Henry remarked, with much displeasure, this general favour borne to the house of York; and the suspicions arising from it, not only disturbed his tranquillity during the whole of his reign, but bred disgust towards his consort herself, and poisoned all his domestic enjoyments.

238
Henry VII.

The reign of Henry VII. was for several years disturbed by plots and insurrections. The people, by a long course of civil war, had become so turbulent and factious, that no governor could rule, nor could any king please them. The violent animosity expressed by this monarch, however, against the house of York, may justly be considered as one of the causes of the extreme proneness to rebellion manifested by his subjects. Instead of endeavouring to conciliate the affection of the opposite party, he always strove to quell them by absolute force and violence. For this purpose he took a journey, soon after his accession, to the north of England, where the Yorkists were very numerous: hoping to get the better of them by his presence. In his journey thither, he received intelligence of an insurrection against him by Viscount Lovel, with Sir Henry Stafford and Thomas his brother, who had raised an army, and were marching to besiege the city of Worcester, while Lovel approached to assist them with a body of three or four thousand men. They were dispersed, however, by the offer of a general pardon; which induced Lovel to withdraw from his troops, who were thereupon obliged to submit to the king's mercy. The Staffords took sanctuary in the church of Colnham near Abingdon; but as it was found that this church had not the privilege of protecting rebels, they were taken from thence: the elder was executed at Tyburn; but the younger, pleading that he had been misled by his brother, received a pardon.

239
His reign
disturbed
by frequent
rebellions.

240
Lovel and
Stafford's
inturrection
suppressed.

This success was soon after followed by the birth of a prince; whom Henry named in honour of the celebrated King Arthur, who is said to have been the direct ancestor of the house of Tudor. All this success, however, as well as the general satisfaction which the birth of a prince descended from the houses both of

241
Prince Ar-
thur born-

England.
242
Discontents
of the peo-
ple.

York and Lancaſter neceſſarily occaſioned, were not ſufficient to reconcile the hearts of the Engliſh to their ſovereign. His extreme ſeverity towards the houſe of York ſtill continued; and unfortunately this was much more beloved by the generality of the nation than that of Lancaſter. Many of the Yorkiſts had been treated with great cruelty, and deprived of their fortunes under pretence of treaſon; a general reſumption had likewiſe been made of the grants made by the princes of the houſe of York. It was likewiſe univerſally believed that the queen herſelf met with harſh treatment, on account of her being one of that unfortunate houſe; and from all theſe circumſtances it was not unreaſonably imagined that his enmity was inveterate and invincible. Hence, notwithſtanding his politic and vigorous adminiſtration, people made no ſcruple of openly expreſſing their diſapprobation of his conduct and government; and one rebellion ſeemed to be extinguished only to give birth to another. The king had, at the commencement of his reign, confined the duke of Clarence's ſon, as has already been mentioned. This unfortunate youth, who had obtained the title of the earl of Warwick, was, through long confinement, entirely unacquainted with the affairs of the world. Simple as he was, however, he was now made uſe of to diſturb the public tranquillity. The queen-dowager was with great reaſon ſuſpected to be at the bottom of this conſpiracy; but not chooſing to interfere openly in the matter herſelf, ſhe employed one Simon a prieſt of Oxford to execute her purpoſes. This man caſt his eyes upon one Lambert Simnel, a baker's ſon in the ſame place, a youth of only 15 years of age; but who, from his graceful appearance and accompliſhments, ſeemed proper for perſonating a man of quality. A report had been ſpread among the people, that Richard duke of York, ſecond ſon of Edward IV. had ſecretly made his eſcape from the cruelty of his uncle, and lay ſomewhere concealed in England. Simon had at firſt inſtructed his pupil to aſſume that name, which he found to be much the object of public affection; but hearing afterwards a new report, that Warwick had eſcaped from the Tower, and obſerving that this news was attended with no leſs general ſatisfaction, he changed the plan of his impoſture, and made Simnel perſonate that unfortunate prince. The pliant youth was therefore directed by his inſtructor to talk upon many occurrences, as happening to him in the court of Edward. But as the impoſtor was not calculated to bear cloſe examination, he was removed to Ireland: and ſo well had he profited by the leſſons given him, that he no ſooner preſented himſelf to the earl of Kildare the deputy, claiming his protection as the unfortunate earl of Warwick, than he began to conſult with ſeveral other noblemen with regard to him. Theſe expreſſed even a ſtronger belief in Simnel's ſtory than the deputy himſelf had done; and in proportion as the ſtory was ſpread abroad, the more credit it obtained. The impoſtor was lodged in the caſtle of Dublin; the inhabitants univerſally took an oath of allegiance to him, as the true deſcendant of the Plantagenets; he was crowned with a diadem taken from the ſtatue of the bleſſed virgin, and proclaimed king by the title of Edward VI.; and the whole kingdom followed the example of the capital.

Such an unexpected event alarmed Henry ſo much,

that he would have gone over to Ireland on purpoſe to quell the rebellion in perſon, had he not been afraid of the machinations of the queen-dowager in his abſence. To prevent any thing of this kind, it was reſolved to confine her for life in a monaſtery; under pretence, however, that it was done on account of her having formerly delivered up the princeſs her daughter to King Richard. The queen murmured againſt the ſeverity of her treatment; but the king perſiſted in his reſolution, and ſhe remained in confinement till the time of her death, which happened ſome years after.

The next meaſure was to ſhow Warwick to the people. He was taken from the Tower, and led through the principal ſtreets of London; after which he was conducted in ſolemn proceſſion to St Paul's, where great numbers were aſſembled to ſee him. Still, however, they proceeded in Dublin to honour their pretended monarch; and he was crowned with great ſolemnity in the preſence of the earl of Kildare, the chancellor, and the other officers of ſtate. At laſt being furniſhed by the duchefs of Burgundy with a body of 2000 veteran Germans under the command of Martin Swart, a brave and experienced officer, he reſolved to invade England. He landed in Lancaſhire, from whence he marched to York, expecting that the country people would riſe and join him on his march. But in this he was deceived: the people were unwilling to join a body of foreigners; and were beſides kept in awe by the great reputation of Henry. Lord Lincoln, therefore, who commanded the rebel army, determined to bring the matter to a ſpeedy iſſue. Accordingly he met the royal army at Stoke in the county of Nottingham. An obſtinate engagement enſued, but at length King Henry obtained a complete victory. Lord Lincoln, with 4000 private men, periſhed in the battle; and Simnel with his tutor Simon were taken priſoners. Simon being a prieſt, could not be tried by the civil power, and was only committed to cloſe confinement. Simnel was pardoned, and made a ſcullion in the king's kitchen, whence he was afterwards advanced to the rank of falconer, in which employment he died.

Henry being now freed from all danger from that quarter, determined to take ample vengeance on his enemies. For this purpoſe he took a journey into the north; but though he found many delinquents, his natural avarice prompted him to exact heavy fines from them rather than to put them to death. His proceedings, however, were extremely arbitrary; the criminals being tried, not by the ordinary judges, but either by commiſſioners appointed for the occaſion, or ſuffering puniſhment by ſentence of a court-martial. Having thus fully eſtabliſhed his authority as far as it could be done by ſuppreſſing and puniſhing domeſtic enemies, he next determined to recommend himſelf to his ſubjects by a report of his military diſpoſition; hoping, that by undertaking, or pretending to undertake, ſome martial enterpriſes, he would thus gain the favour of a people naturally turbulent, and unaccuſtomed to live long at peace with their neighbours. He certainly had not, however, the leaſt intention of proſecuting foreign conqueſts; though, to pleaſe the people, he frequently gave out that he deſigned to invade France, and lay waſte the whole country, rather than not recover his continental poſſeſſions. Under theſe pretences, particularly that of aſſiſting the Bretons, whom the king

England.
244
The queen-
dowager
confined.

243
Impoſture
of Lambert
Simnel.

245
Henry pu-
niſhes his
enemies.

246
Pretends a
deſire of a-
chieving
martial ex-
ploits.

England. king of France had lately subdued, and who had applied to him for relief, he persuaded his parliament to grant him a considerable supply; but this involved him in some difficulties. The counties of Durham and York, who had always been discontented with Henry's government, and still farther provoked by the oppressions under which they had laboured after the extinction of Simnel's rebellion, opposed the commissioners sent by the king to levy the tax. The latter applied to the earl of Northumberland, requesting his advice and assistance in the execution of their office; but instead of being able to enforce the levying of the tax, he himself was attacked and put to death by the insurgents. This act of violence committed by themselves, seemed to render the insurgents desperate, so that without more ado they prepared to resist the royal power, under the conduct of one Sir John Egremont; but in this ill-conducted and precipitate scheme they met with no success. Henry instantly levied a considerable force, which he committed to the charge of the earl of Surrey; by whom the rebels were quickly defeated, and one of their leaders taken prisoner. Sir John Egremont fled to the duchess of Burgundy, who afforded him protection.

247
Obtains a subsidy on pretence of assisting the inhabitants of Bretagne.

248
An insurrection suppressed.

249
Henry makes a feigned invasion of France.

250
Obtains a sum of money and annual pension.

251
Imposture of Perkin Warbeck.

Thus Henry obtained the subsidy which he had solicited under pretence of invading France, though he would willingly have avoided any expence in preparations for that purpose in order to keep the money in his possession; but as the Bretons had applied to him for assistance, he found himself obliged to attempt something. With this view he set sail for Calais with an army of 25,000 foot and 1600 horse, of which he gave the command to the duke of Bedford and the earl of Oxford: but notwithstanding this apparent hostile disposition, negotiations for peace had been secretly begun, and commissioners even appointed to consider of the terms, three months before King Henry set out for the continent. As the love of money was the prevailing passion of the English monarch, and the possession of Bretagne was a great object to France, an accommodation soon took place betwixt the contending parties. The king of France engaged to pay Henry near 200,000*l.* as a reimbursement for the expences of his expedition, and stipulated at the same time to pay him and his heirs an annual pension of 25,000 crowns more.

Thus the authority of Henry seemed to be so firmly established, as to leave no reason to dread any rival in time to come; but still he found himself mistaken. The duchess of Burgundy, resenting the depression of her family, and exasperated by her frequent miscarriages in the attempts already made, resolved to make a final effort against Henry, whom she greatly hated. For this purpose she propagated a report that her nephew Richard Plantagenet, duke of York, had escaped from the tower where his elder brother was murdered, and that he still lay somewhere concealed. Finding this report eagerly received, she soon found a young man who assumed both his name and character. The person chosen to act this part was the son of one Osbeck, or Warbeck, a converted Jew, who had been in England during the reign of Edward IV. His name was *Peter*; but it had been corrupted after the Flemish manner into *Peterkin*, or *Perkin*. It was by some

believed, that Edward, among his other amorous adventures, had a secret correspondence with Warbeck's wife, which might account for the great similarity of features between Perkin and that monarch. The duchess of Burgundy found this youth entirely suited to her purposes. The lessons she gave him were easily learned and strongly retained. His graceful air, his courtly address, his easy manners, and elegant conversation, were capable of imposing upon all but those who were privy to the imposture. The kingdom of Ireland was pitched upon for Perkin's first appearance, as it had been before for that of Simnel. He landed at Cork; and immediately assuming the name of *Richard Plantagenet*, was followed by great numbers of credulous people. He wrote letters to the earls of Desmond and Kildare, inviting them to join his party; he dispersed everywhere the strange intelligence of his escape from his uncle Richard's cruelty; and his story meeting with general credit, he soon became an object of the public favour. All those who were disgusted with the king, prepared to join Perkin; but particularly those who formerly were Henry's favourites, and had contributed to place him on the throne. These, thinking their services had not been sufficiently repaid, now became heads of the conspiracy. Their attempts, however, were all frustrated by the vigilance of the king, and most of the conspirators of any note were publicly executed.

Perkin finding it was in vain to attempt any thing in England, went to the court of James IV. of Scotland. Here he was received with great cordiality; and James carried his confidence in him so far, that he even gave him in marriage Lady Catherine Gordon, daughter to the earl of Hontley, and a near kinswoman of his own. But when he attempted to set him on the throne of England, he found himself totally disappointed; and on the conclusion of peace between the two kingdoms, Perkin was obliged to leave Scotland. From thence he went to Flanders; and meeting with but a cool reception there, he resolved to try the affections of the people of Cornwall, who had lately risen against the king on account of a new tax which had been levied upon them. On his first appearance, Perkin was joined by about 3000 of these people, with which force he laid siege to Exeter. Henry, however, having marched against him with a considerable army, Perkin's heart failed him, though his followers now amounted to 7000; and he took shelter in a monastery. His wife fell into the conqueror's hands; who placed her in a respectable situation near the queen's person, with a suitable pension, which she enjoyed till her death. Perkin being persuaded to deliver himself into the king's hand, was compelled to sign a confession of his former life and conduct; but this was so defective and contradictory, that very little regard was paid to it. His life was granted him; though he was still detained in custody, and keepers were appointed to watch his conduct. From these, however, he broke loose; and flying to the sanctuary of Shyne, put himself into the prior's hands. He was once more prevailed upon to trust himself in the king's hands, and was committed to the tower; but having here entered into a correspondence with the earl of Warwick in order to make their escape, both of them were condemned and executed.

To Henry VII. in a great measure, is owing the present

England.
[251]
English na-
tion civi-
lized by
Henry.

present civilized state of the English nation. He had all along two points principally in view; the one to depress the nobility and clergy, and the other to exalt and humanize the populace. In the feudal times every nobleman was possessed of a certain number of vassals, over whom he had, by various methods, acquired an almost absolute power; and, therefore, upon every slight disgust, he was able to influence them to join him in his revolt or disobedience. Henry considered, that the giving of his barons a power to sell their estates, which were before unalienable, must greatly weaken their interest. This liberty therefore he gave them; and it proved highly pleasing to the commons, nor was it disagreeable to the nobles themselves. His next scheme was to prevent their giving liveries to many hundreds of their dependents, who were thus kept like the soldiers of a standing army to be ready at the command of their lord. By an act passed in this reign, none but menial servants were allowed to wear a livery; and this law was enforced under severe penalties.

With the clergy, Henry was not so successful. The number of criminals of all kinds who found protection in monasteries and other places appointed for religious worship, seemed to indicate little less than an absolute toleration of all kinds of vice. Henry used all his interest with the pope to get these sanctuaries abolished, but to no purpose. All that he could procure was, that if thieves, murderers, or robbers, registered as sanctuary men, should fall out and commit fresh offences, and retreat again, in such cases they might be taken out of the sanctuary and delivered up to justice.

In 1500, the king's eldest son Arthur was married to the Infanta Catharine of Spain, which marriage had been projected and negotiated seven years. But the prince dying in a few months after marriage, the princess was obliged to marry his younger brother Henry, who was created prince of Wales in his room. Henry himself made all the opposition which a youth of 12 years of age is capable of: but as the king persisted in his resolution, the marriage was by the pope's dispensation shortly after solemnized.—In the latter part of this king's reign, his economy, which had always been exact, degenerated into avarice, and he oppressed the people in a very arbitrary manner. He had two ministers, Empson and Dudley, perfectly qualified to second his avaricious intentions. They were both lawyers, and usually committed to prison by indictment such persons as they intended to oppress; from whence they seldom got free but by paying heavy fines, which were called mitigations and compositions: but by degrees the very forms of law were omitted; and they determined in a summary way upon the properties of the subjects, and confiscated their effects to the royal treasury.—Henry VII. died of the gout in his stomach, in the year 1509, having lived 52 years, and reigned 23; and was succeeded by his son Henry VIII. In Henry VII.'s reign was built a large ship of war called the *Great Harry*, which cost 14,000*l*. This was, properly speaking, the first ship in the English navy. Before this period, when the king wanted a fleet, he had no other expedient than to hire ships from the merchants.

252
Death of
Henry VII.

253

Henry VIII. Henry VIII. ascended the throne when he was a-

bout 18 years of age, and had almost every advantage which a prince can have on his accession. He had a well-stored treasury, and undisputed title, and was at peace with all the powers in Europe. Commerce and arts had been some time introduced into England, where they met with a favourable reception. The young prince himself was beautiful in his person, expert in all polite exercises, open and liberal in his air, and loved by all his subjects. The old king, who was himself a scholar, had instructed him in all the learning of the times, so that he was an adept in school-divinity before the age of 18.

England.

All these advantages, however, seemed to have been lost upon the new king. Being destitute of a good heart and solid understanding, he proved a tyrant. Being always actuated, not by reason, but the passion which happened to be uppermost in his mind, he behaved in the most absurd and contradictory manner; and however fortunate some of his measures proved at last, it is impossible that either his motives, or the means he took for the accomplishment of his purposes, can be approved of by any good man.

One of Henry's first actions in his royal capacity was to punish Empson and Dudley, who were obnoxious to the populace on account of their having been the instruments of the late king's rapacity. As they could not be impeached merely on account of their having strictly executed the will of the king, they were accused of having entered into a treasonable conspiracy, and of having designed to seize by force the administration of government; and though nothing could be more improbable than such a charge, the general prejudice against them was so great, that they were both condemned and executed.

In 1510, the king entered into a league with Pope Julius II. and Ferdinand king of Spain, against Louis XII. of France. In this alliance Henry was the only disinterested person. He expected nothing besides the glory which he hoped would attend his arms, and the title of *Most Christian King*, which the pope assured him would soon be taken from the king of France to be conferred upon him. The pope was desirous of wresting from Louis some valuable provinces which he possessed in Italy, and Ferdinand was desirous of sharing in the spoil. Henry summoned his parliament; who very readily granted him supplies, as he gave out that his design was to conquer the kingdom of France, and annex it to the crown of England. It was in vain that one of his old prudent counsellors objected, that conquests on the continent would only drain the kingdom without enriching it; and that England, from its situation, was not fitted to enjoy extensive empire. The young king, deaf to all remonstrances, and hurried away by his military ardour, resolved immediately to begin the war. But after several attempts, which were rendered unsuccessful only by the mismanagement of those who conducted them, a peace was concluded with France on the 7th of August 1514.

Henry's arms were attended with more success in Scotland; where King James IV. with the greatest part of the Scots nobility, and 10,000 of the common people, were cut off in the battle of Flodden. Henry in the mean time, puffed up with his imaginary successes against France, and his real ones against Scotland,

See Scot-land.

land, continued to lavish his treasures by expensive pleasures, and no less expensive preparations for war. The old ministers who had been appointed by his father to direct him, were now disregarded; and the king's confidence was entirely placed in Thomas afterwards Cardinal Wolsey, who seconded him in all his favourite pursuits, and who, being the son of a private gentleman at Ipswich, had gradually raised himself to the first employments of the state*. He doth not seem to have had many bad qualities besides his excessive pride, which disgusted all the nobility; but the great share he possessed in the favour of such an absolute prince as Henry VIII. put him quite out of the reach of his enemies.

254
Cardinal
Wolsey
minister.

* See Wol-
sey.

255
Arbitrary
behaviour
of the king.

The king having soon exhausted all the treasures left him by his father, as well as the supplies which he could by fair means obtain from his parliament, applied to Wolsey for new methods of replenishing his coffers. The minister's first scheme was to get a large sum from the people under the title of *benevolence*; though no title could be more improperly applied, as it was not granted without the greatest murmurings and complaints. Wolsey even met with opposition in the levying of it. In the first place, having exacted a considerable sum from the clergy, he next applied himself to the house of commons; but they only granted him half the sum he demanded. The minister at first was highly offended, and desired to be heard in the house; but they replied, that none could be permitted to sit and argue there except such as were members. Soon after, the king having occasion for new supplies, by Wolsey's advice attempted to procure them by his prerogative alone, without consulting his parliament. He issued out commissions to all the counties of England for levying four shillings in the pound from the clergy, and three shillings and fourpence from the laity. This stretch of royal power was soon opposed by the people, and a general insurrection seemed ready to ensue. Henry endeavoured to pacify them by circular letters; in which he declared, that what he demanded was only by way of benevolence. The city of London, however, still hesitated on the demand; and in some parts of the country insurrections were actually begun. These were happily suppressed by the duke of Suffolk; but the cardinal lost somewhat of the king's favour on account of the improper advice he had given him. To reinstate himself in his good graces, Wolsey made the king a present of a noble palace called *York-place*, at Westminster, assuring him that from the first he had intended it for the king's use. In order to have a pretence for amassing more wealth, Wolsey next undertook to found two new colleges at Oxford; and for this purpose he received every day fresh grants from the pope and the king. The former imprudently gave him liberty to suppress some monasteries, and make use of their revenues for the erection of his new colleges; but this was a fatal precedent for the pontiff's interests, and it taught the king to seize on the monastic revenues whenever he stood in need of money.

For a considerable time Wolsey continued to enjoy the king's favour in an extreme degree; and as no monarch was ever more despotic than Henry VIII. no minister was more powerful than Wolsey. This extraordinary elevation served only to render his fall the more conspicuous, and himself the more miserable,

when it took place: and what was worse, he had long foreseen, from what he knew of the king's capricious and obstinate temper, that it certainly would happen one time or other. The cause of his final overthrow was the desire King Henry began to entertain of having his queen Catharine divorced. The doctrines of the reformation, propagated by Luther in 1517, had gained considerable ground in England, and many professed a belief in them, notwithstanding the severe persecution which had been carried on against heretics during some of the preceding reigns. The clergy had become so exceedingly corrupt, and were immersed in such monstrous ignorance, that they were universally hated even by their own party; while no regard at all was paid to their decisions, or rather they were looked upon with the utmost abhorrence, by the reformers. Even the papal authority, though still very great, had, in no greater a space of time than ten years (*viz.* from 1517, when Luther first began to attack it, to the present year 1527), declined very sensibly. The marriage of King Henry, therefore, being looked upon by all parties as in itself illegal, and only sanctified by a dispensation from the pope, had been frequently objected to on different occasions. We are informed by some authors, that when Henry VII. betrothed his son, at that time only 12 years of age, he evidently showed an intention of taking afterwards a proper opportunity to annul the contract; and that he ordered Prince Henry, as soon as he should come of age, to enter a protestation against the marriage; charging him on his death-bed not to finish an alliance so unusual, and liable to such insuperable objections. Some members of the privy council, particularly Warham the primate, afterwards declared against the completion of the marriage; and even after it was completed, some incidents which in a short time took place were sufficient to make him sensible of the general sentiments of the public on that subject. The states of Castile had opposed a marriage betwixt the emperor Charles and the English princess Mary, Henry's daughter, urging among other things the illegitimacy of her birth. The same objection afterwards occurred on opening a negotiation with France for a marriage with the duke of Orleans.

England.
Cause of
Wolsey's
disgrace

257
Scruples
concerning
the legality
of Henry's
marriage.

If these accounts are to be depended upon as authentic, we can scarce conceive it possible but Henry himself must have been somewhat staggered by them; though it is by no means probable that they were his only motives. The queen was six years older than the king, her personal charms were decayed, and his affection lessened in proportion. All her children had died in infancy except one daughter, the princess Mary above mentioned; and Henry was, or pretended to be, greatly struck with this, as it seemed something like the curse of being childless, pronounced in the Mosaic law against some evil doers. Another point of the utmost importance was the succession to the crown, which any question concerning the legitimacy of the king's marriage would involve in confusion. It was also supposed, with great reason, that should any obstacles of this kind occur, the king of Scotland would step in as the next heir, and advance his pretensions to the crown of England. But above all, it is probable that he was influenced by the love he had now contracted for Anne Boleyn, who had lately leyn.

258
Other rea-
sons for
Henry's de-
sire of a di-
vorce.

259
His love for
Anne Bo-

been.

England. been appointed maid of honour to the queen. In this station Henry had frequent opportunities of seeing her, and soon became deeply enamoured; and finding that his passion could not be gratified but by a marriage, it is not to be doubted that he was thus obstinately set upon the divorce; for which purpose he sent his secretary to Rome to obtain from Clement a bull for dissolving his marriage with Catharine. That he might not seem to entertain any doubt of the pope's prerogative, he intited only on some grounds of nullity in the bull granted by his predecessor Julius for the accomplishment of the marriage. In the preamble to this bull, it had been said, that it was granted only upon the solicitation of Henry himself; though it was known that he was then a youth under 12 years of age: it was likewise asserted, that the bull was necessary for maintaining the peace between the two crowns; though otherwise it is certain that there was no appearance of a quarrel betwixt them. These false premises seemed to afford a very good pretence for dissolving it; but, as matters then stood, the pope was involved in the utmost perplexity. Queen Catharine was aunt to the emperor, who had lately made Clement himself a prisoner, and whose resentment he still dreaded: and besides, he could not with any degree of prudence declare the bull of the former pope illicit, as this would give a mortal blow to the doctrine of papal infallibility. On the other hand, Henry was his protector and friend; the dominions of England were the chief resource from whence his finances were supplied; and the king of France, some time before, had got a bull of divorce in circumstances nearly similar. In this exigence he thought the wisest method would be to spin out the affair by negotiation; and in the mean time he sent over a commission to Wolsey, in conjunction with the archbishop of Canterbury or any other English prelate, to examine the validity of the king's marriage and of the former dispensation; granting them also a provisional dispensation for the king's marriage with any other person.

260
Sends to
Rome to
obtain a di-
vorce.

261
Extreme
perplexity
of the
pope.

The pope's message was laid before the council in England: but they considered, that an advice given by the pope in this secret manner might very easily be disavowed in public; and that a clandestine marriage would totally invalidate the legitimacy of any issue the king might have by such a match. In consequence of this, fresh messengers were dispatched to Rome, and evasive answers returned; the pope never imagining that Henry's passion would hold out during the tedious course of an ecclesiastical controversy. But in this he was mistaken. The king of England had been taught to dispute as well as the pope, and valued himself not a little on his knowledge in theology: and to his arguments he added threats; telling him, that the English were but too well disposed to withdraw from the holy see; and that if he continued uncomplying, the whole country would readily follow the example of their monarch, who should always deny obedience to a pontiff that had treated him with such falsehood and duplicity. The king even proposed to his holiness whether, if he were not permitted to divorce his present queen, he might not have a dispensation for having two wives at once?

262
Henry's
controversy
with him.

The pope, perceiving the king's eagerness, at last sent Cardinal Campegio his legate to London; who

with Wolsey, opened a court for trying the legitimacy of the king's marriage with Catharine, and cited the king and queen to appear before them. The trial commenced the 31st of May 1529; and both parties presented themselves. The king answered to his name when called: but the queen, instead of answering to hers, rose from her seat, and, throwing herself at the king's feet, made a very pathetic harangue; which her dignity, her virtue, and misfortunes, rendered still more affecting. She told her husband, "That she was a stranger in his dominions, without protection, without counsel, and without assistance; exposed to all the injustice which her enemies were pleased to impose upon her: That she had quitted her native country, without any other resource than her connections with him and his family; and that, instead of suffering thence any violence or iniquity, she had been assured of having in them a safeguard against every misfortune: That she had been his wife during 20 years; and would here appeal to himself, whether her affectionate submission to his will had not merited other treatment than to be thus, after so long a time, thrown from him with indignity: That she was conscious,—he himself was assured,—that her virgin honour was yet unstained when he received her into his bed; and that her connections with his brother had been carried no farther than the mere ceremony of marriage: That their parents, the kings of England and Spain, were esteemed the wisest princes of their time, and had undoubtedly acted by the best advice when they formed the agreement for that marriage, which was now represented as so criminal and unnatural: And that she acquiesced in their judgment, and would not submit her cause to be tried by a court whose dependance on her enemies was too visible ever to allow her any hopes of obtaining from them an equitable or impartial decision." Having spoken these words, the queen rose, and, making the king a low reverence, left the court; nor would she ever again appear in it. The legate having again summoned the queen to appear before them, on her refusal, declared her contumacious, and the trial proceeded in her absence. But when the business seemed to be nearly decided, Campegio, on some very frivolous pretences, prorogued the court, and at last transferred the cause before the see of Rome.

England.
263
Trial of the
king and
queen be-
fore the
pope's le-
gate.

All this time Cardinal Wolsey seemed to be in the same dilemma with the pope, and indeed much worse; as he could not boast of the same independence which his holiness possessed. On the one hand, he was very solicitous to gratify the king his master, who had distinguished him by so many and extraordinary marks of favour; on the other, he feared to offend the pope, whose servant he more immediately was, and who likewise had power to punish his disobedience. He had long known that this affair was certainly to end in his ruin; and by attempting to please all parties, he fell under the displeasure of every one; so that he was at last left without a single friend in the world. The king was displeased on account of his not entering into his cause with the warmth he thought he had reason to expect; Anne Boleyn imputed to him the disappointment of her hopes; while even Queen Catharine and her friends expressed the greatest indignation against him on account of the part he had openly taken in the affair of her divorce. In this miserable situation the king

264
Embarrass-
ment of
Cardinal
Wolsey.

England. king sent him a message by the dukes of Norfolk and Suffolk, demanding the great seal: the cardinal refused to deliver it without a more express warrant; upon which Henry wrote him a letter, and on receipt of this it was instantly given up. The seal was bestowed on Sir Thomas More; a man who, besides elegant literary talents, was possessed of the highest capacity, integrity, and virtue. Wolsey was next commanded to depart from York-place palace which he had built in London; and which, though it belonged to the see of York, was now seized by the king, and afterwards became the residence of the British sovereigns, under the name of *Whitehall*. All his furniture and plate, the richness of which seemed rather proper for a monarch than a subject, was seized for the king's use. He was then commanded to retire to Esher, a country-seat which he possessed near Hampton court, and there to wait the king's pleasure. One disgrace followed another; and his fall was at length completed by a summons to London to answer a charge of high treason. This summons he at first refused to answer, as being a cardinal. However, being at length persuaded, he set out on his journey; but was taken ill, and died by the way. See the article **WOLSEY**.

265
Is disgraced and persecuted.

266
All the universities of Europe consulted about the legality of the king's marriage.
* See *Cranmer*.

267
Henry's final quarrel with the pope.

After the death of Wolsey, the king, by the advice of Cranmer *, had the legality of his marriage debated in all the universities of Europe; and the votes of these were obtained in his favour by dint of money. The disbursements made on the occasion have even been preserved to this day. To a subdeacon he gave a crown, to a deacon two crowns, and so to the rest in proportion to the importance of their station or opinion.—Being thus fortified by the opinions of the universities, and even of the Jewish rabbies (for them also he had consulted), Henry began to think he might safely oppose the pope himself. He began by reviving in parliament an old law against the clergy, by which all those who had submitted to the authority of the pope's legate were condemned to severe penalties. The clergy, to conciliate the king's favour, were obliged to pay a fine of 118,000 pounds. A confession was likewise extorted from them, that the king, and not the pope, was the supreme head of the church and clergy of England. An act was soon after passed against levying the first-fruits, or a year's rent of all the bishoprics that fell vacant. After this the king privately married his beloved Anne Boleyn; and she proving with child soon after marriage, he publicly owned her for his wife, and passed with her through London, with a greater magnificence than had ever been known before. The streets were strewed with flowers, the walls of the houses hung with tapestry, and a universal joy seemed to be diffused among the people. The unfortunate queen Catharine, perceiving all further opposition to be vain, retired to Amphyll near Dunstable, where she continued the rest of her days in privacy and peace. Her marriage with Henry was at last declared invalid, but not till after the latter had been married to Anne Boleyn, though this declaration ought undoubtedly to have preceded it. See **BOLEYN**.

The pope was no sooner informed of these proceedings, than he passed a sentence, declaring Catharine to be the king's only lawful wife; requiring him to take her again, and denouncing his censures against him in case of a refusal. Henry, on the other hand, knowing

that his subjects were entirely at his command, resolved to separate totally from the church of Rome. In the year 1534, he was declared head of the church by parliament; the authority of the pope was completely abolished in England; all tributes formerly paid to the holy see were declared illegal; and the king was entrusted with the collation to all ecclesiastical benefices. The nation came into the king's measures with joy, and took an oath called the *oath of supremacy*; all the credit which the popes had maintained over England for ages was now overthrown at once; and none seemed to repine at the change, except those who were immediately interested by their dependence on Rome.

England.
268
Is declared head of the church.

But though the king thus separated from the church of Rome, he by no means adhered to the doctrines of Luther which had been lately published. He had written a book against this celebrated reformer, which the pope pretended greatly to admire; and honoured King Henry, on its account, with the title of "Defender of the faith." This character he seemed to be determined to maintain, and therefore persecuted the reformers most violently. Many were burnt for denying the popish doctrines, and some also were executed for maintaining the supremacy of the pope. The courtiers knew not which side to take, as both the new and old religions were equally persecuted; and as both parties equally courted the favour of the king, he was by that means enabled to assume an absolute authority over the nation. As the monks had all along shown the greatest resistance to Henry's ecclesiastical character, he resolved at once to deprive them of the power of injuring him. He accordingly empowered Cromwell, secretary of state, to send commissioners into the several counties of England to inspect the monasteries; and to report, with rigorous exactness, the conduct and deportment of such as were found there. This employment was readily undertaken by some creatures of the court, whose names were Layton, London, Price, Gage, Petre, and Belafis. They are said to have discovered monstrous disorders in many of the religious houses; whole convents of women abandoned to all manner of lewdness; friars accomplices in their crimes; pious frauds everywhere committed, to increase the devotion and liberality of the people; and cruel and inveterate factions maintained between the inhabitants. Thus a general horror was excited against these communities; and therefore the king, in 1536, suppressed the lesser monasteries, amounting to 376 in number. Their revenues, computed at 32,000 pounds a-year, were confiscated to the king's use; besides their plate and other goods, computed at 100,000 pounds more. In 1538, the greater monasteries also were demolished. The better to reconcile the people to this great innovation, stories were published, perhaps with aggravations, of the detestable lives which the friars led in their convents. The relics also, and other objects of superstitious veneration, were now brought forth, and became objects of derision to the reformers. A great number of these are enumerated by Protestant writers; such as the parings of St Edmund's toes; some of the coals that roasted St Laurence; the girdle of the virgin Mary, shown in no fewer than eleven different places; two or three heads of St Ursula; the felt of St Thomas of Lancaster, an infallible cure for the headach; part of St Thomas of Canterbury's shirt, much

269
Suppression of the monasteries.

England. much revered among big-bellied women; some relicks, an excellent preservative against rain, others against weeds in corn, &c. Some impostures, however, were discovered, which displayed a little more ingenuity in the contrivance. At Hales in the county of Gloucester had been shown, during several ages, the blood of Christ brought from Jerusalem. The veneration for this precious relick may easily be imagined; but it was attended with a most remarkable circumstance not observed in any other relicks. The sacred blood was not visible to any one in mortal sin, even when set before him; nor could it be discovered till he had performed good works sufficient for his absolution. At the dissolution of the monastery, the whole contrivance was discovered. Two of the monks who were let into the secret, had taken the blood of a duck, which they renewed every week: they put it into a phial, one side of which was thin and transparent crystal, the other thick and opaque. When any rich pilgrim arrived, they were sure to show him the dark side, till masses and offerings had expiated his offences; after which they made him happy, by turning the phial. —A miraculous crucifix had been kept at Boxely in Kent, and bore the appellation of the *rood of grace*. The lips, eyes, and head of the image, moved on the approach of its votaries. Helsey bishop of Rochester broke the crucifix at St Paul's cross, and showed to all the people the springs and wheels by which it had been secretly moved. A great wooden idol, called *Darvel Gatherin*, was also brought to London and cut in pieces: and, by a cruel refinement of vengeance, it was employed as fuel to burn Friar Forest; who was punished for denying the king's supremacy, and for some pretended heresies. A finger of St Andrew, covered with a thin plate of silver, had been pawned for a debt of 40 pounds; but as the king's commissioners refused to release the pawn, people made themselves very merry with the poor creditor on account of his security. On this occasion also was demolished the noted shrine of Thomas à Becket, commonly called *St Thomas of Canterbury* *. The riches of it were inconceivable: when broken down, the gold with which it was adorned filled two large chests that eight strong men could scarcely carry out of the church. The king, on the whole, suppressed 645 monasteries, of which 28 had abbots who enjoyed seats in parliament. Ninety colleges were demolished in several counties; 2374 chantries and free chapels, and 110 hospitals. The whole revenue of these establishments amounted to 161,100 pounds.

* See
Becket.

It is easy to imagine the indignation which such an uninterrupted course of sacrilege and violence would occasion at Rome. In 1535, the king had executed Bishop Fisher, who was created a cardinal while in prison, and Sir Thomas More, for denying or speaking ambiguously about his supremacy. When this was reported in Italy, numerous libels were published all over the country, comparing the king of England to Nero, Domitian, Caligula, and the most wicked tyrants of antiquity. Clement VII. died about six months after he had threatened the king with a sentence of excommunication; and Paul III. who succeeded him in the papal throne, entertained some hopes of an accommodation. But Henry was so much accustomed to domineering, that the quarrel was soon rendered totally

incurable. The execution of Fisher was reckoned such a capital injury, that at last the pope passed all his censures against the king, citing him and all his adherents to appear in Rome within 90 days, in order to answer for their crimes. If they failed, he excommunicated them; deprived the king of his realm; subjected the kingdom to an interdict; declared his issue by Anne Boleyn illegitimate; dissolved all leagues which any Catholic princes had made with him; gave his kingdom to any invader; commanded the nobility to take up arms against him; freed his subjects from all oaths of allegiance; cut off their commerce with foreign states; and declared it lawful for any one to seize them, to make slaves of their persons, and to convert their effects to his own use. But though these censures were then passed, they were not openly denounced. The pope delayed the publication till he should find an agreement with England totally desperate, and till the emperor, who was then hard pressed by the Turks and the Protestant princes of Germany, should be in a condition to carry the sentence into execution. But in 1538, when news arrived at Rome that Henry had proceeded with the monasteries as above related, the pope was at last provoked to publish the censures against him. Libels were again dispersed, in which he was anew compared to the most furious persecutors of antiquity, and the preference was now given on their side. Henry, it was said, had declared war with the dead, whom the Pagans themselves respected; was at open enmity with heaven; and had engaged in professed hostility with all the saints and angels. Above all, he was reproached with his resemblance to the emperor Julian, whom (it was said) he imitated in his apostasy and learning, though he fell short of him in his morals. But these terrible fulminations had now lost their effect. Henry had long ago denied the supremacy of the pope, and therefore had appealed from him to a general council; but now, when a general council was summoned at Mantua, he refused to be subject to it, because it was called by the pope, and lay entirely under subjection to that spiritual usurper. He engaged his clergy to make a declaration to the like purpose, and prescribed to them many other alterations with regard to their ancient tenets and practices. It was expected that the spirit of opposition to the church of Rome would have at last made him fall in with the doctrines of the reformed; but though he had been gradually changing the theological system in which he was educated, ever since he came to the years of maturity, he was equally positive and dogmatical in the few articles he retained, as though the whole fabric had continued entire and unshaken: and though he stood alone in his opinion, the flattery of courtiers had so much inflamed his tyrannical arrogance, that he thought himself entitled to regulate by his own particular standard the religious faith of the whole nation. The point on which he chiefly rested his orthodoxy was the most absurd in the whole popish doctrine; namely, that of transubstantiation. All departure from this he held to be a damnable error; and nothing, he thought, could be more honourable for him, than, while he broke off all connections with the Roman pontiff, to maintain, in this essential article, the purity of the Catholic faith.

In 1539, a parliament was called, which met on the 28th day of April. The chancellor opened parliament

England.
The king
270
excommunicated.

271
His absurd
and tyrannical
conduct.

England. parliament by informing the house of lords, that it was his majesty's earnest desire to extirpate from his kingdom all diversity of opinions with regard to religion; and as this enterprise was, he owned, difficult and important, he desired them to choose a committee from among themselves, who might frame certain articles, and communicate them afterwards to parliament. The lords named the vicar-general Cromwell, now created a peer, the archbishops of Canterbury and York, the bishops of Durham, Carlisle, Worcester, Bath and Wells, Bangor, and Ely. This small committee itself was agitated with such diversity of opinions, that it could come to no conclusion. The duke of Norfolk then moved, that since there was no hope of having a report from the committee, the articles of faith proposed to be established should be reduced to six, and a new committee be appointed to frame an act with regard to them. As this peer was understood to speak the king's mind, his motion was immediately complied with; and, after a short prorogation, the bill of the six articles, or the *bloody bill*, as the Protestants justly termed it, was introduced; and having passed the two houses, received the king's assent. By this law the doctrine of the real presence was established; the communion in one kind; the perpetual obligation of vows of chastity; the utility of private masses; the celibacy of the clergy; and the necessity of auricular confession. The denial of the real presence subjected the person to death by fire, and to the same forfeiture as in cases of treason; and admitted not the privilege of abjuring: an unheard-of cruelty, unknown even to the inquisition itself. The denial of any of the other articles, even though recanted, was punishable by the forfeiture of goods and chattels, and imprisonment during the king's pleasure: an obstinate adherence to error, or a relapse, was adjudged to be felony, and punishable by death. The marriage of priests was subjected to the same punishment. Their commerce with women was, for the first offence, forfeiture and imprisonment; and for the second, death. Abstaining from confession, and from receiving the eucharist at the accustomed times, subjected the person to fine, and to imprisonment during the king's pleasure; and if the criminal persevered after conviction, he was punishable by death and forfeiture, as in cases of felony. Commissioners were to be appointed by the king for inquiring into these heresies and irregular practices, and the criminals were to be tried by a jury.

The parliament having thus surrendered their ecclesiastical privileges, next proceeded to surrender their civil ones also. They gave to the king's proclamations the same force as to statutes enacted by parliament, and thus by one blow made a total subversion of the English constitution; and to render the matter worse, if possible, they framed this law as if it were only declaratory, and intended to explain the natural extent of the royal authority.—Notwithstanding this, however, they afterwards pretended to make some limitations in the regal power; and they enacted, that no proclamation should deprive any person of his lawful possessions, liberties, inheritances, &c. nor yet infringe any common law or laudable custom of the realm.

As soon as the act of the six articles had passed, the Catholics were extremely vigilant to inform against of-

fenders; and, in a short time, no fewer than 500 persons were thrown into prison. But some of the chief officers of state remonstrating against the cruelty of punishing such a number of delinquents, they were all of them set at liberty; and soon after this, Henry, as if he had resolved to give each party the advantage by turns, granted every one permission to have a translation of the Bible, which had been newly made, in his family.

In 1540, the king again complained to parliament of the great diversity of religious tenets which prevailed among his subjects; a grievance, he affirmed, which ought the less to be endured, because the scriptures were now published in England, and ought universally to be the standard of belief to mankind. But he had appointed, he said, some bishops and divines to draw up a list of tenets; and he was determined that Christ and the truth should have the victory; whence he seems to have expected more from this new book of his doctors, than had ensued from the publication of the scriptures. Cromwell, as vicar-general, also made a speech in the upper house; and the peers in return told him, that he deserved to be vicar-general to the universe: To such a degree of mean and servile submission was the English parliament at this time reduced.

This year also the king suppressed the only religious order remaining in England; namely, the knights of St John of Jerusalem, or the *knights of Malta*, as they are commonly called. This order had by their valour done great service to Christendom; and had very much retarded, at Jerusalem, Rhodes, and Malta, the rapid progress of the barbarians. During the general surrender of the religious houses in England, they had obstinately refused to give up their revenues to the king; and Henry who would endure no society that professed obedience to the pope, was obliged to have recourse to parliament for the dissolution of this order. Their revenues were large, and formed a considerable addition to the acquisitions which the king had already made. But he had been such a bad economist, that, notwithstanding the immense plunder afforded him by the church, he now demanded from parliament a very considerable supply. The commons, however, though lavish of the blood of their fellow-subjects, were extremely frugal of their money; and it was not without murmuring that the grant could be obtained, even by this absolute and dreaded monarch.

The king all this time continued to punish with unrelenting severity the Protestants who offended against the law of the six articles, and the Papists who denied his supremacy; which gave occasion to a foreigner at that time to say, that those who were against the pope were burned, and those who were for him were hanged. The king even seemed to display in an ostentatious manner his tyrannical justice and impartiality, which reduced both parties to subjection. This year he executed three Protestants and three Papists coupled together. The latter declared, that the most grievous part of their punishment was the being coupled to such heretical miscreants as suffered with them.

In 1542, Henry proceeded to the further dissolution of colleges, hospitals, and other foundations of that nature. The courtiers had been dealing with the presidents and governors to make a surrender of their

P

revenues

²⁷²
Law of the
six articles
framed.

England.

²⁷³
Suppression
of the
knights of
Malta.

²⁷⁴
And of ma-
ny colleges,
hospitals,
&c.

England. revenues to the king; and they had succeeded with eight. But there was an obstacle to their farther progress: it had been provided by the local statutes of most of these foundations, that no president nor any fellows could make such a deed without the unanimous consent of all the fellows. This consent would not have been easily obtained; but the parliament proceeded in a summary manner to annul all these statutes: by which means the revenues of those houses were exposed to the rapacity of the king and his favourites. Henry also now extorted from many bishops a surrender of their chapter-lands; by which means he pillaged the fees of Canterbury, York, and London, and enriched his favourites with their spoils. He engaged the parliament to mitigate the penalties of the six articles, as far as regarded the marriage of priests, which was now only subjected to a forfeiture of goods, chattels, and lands during life: he was still equally bent on maintaining a rigid purity in speculative principles. He had appointed a commission consisting of two archbishops and several bishops of both provinces, together with a considerable number of doctors of divinity; and by virtue of his ecclesiastical supremacy he had charged them to choose a religion for his people. Before the commissioners, however, had made any progress in this arduous undertaking, the parliament had passed a law by which they ratified all the tenets which these divines should establish with the king's consent; and thus they were not ashamed of declaring expressly that they took their religion upon trust, and had no other rule either in religious or temporal concerns than the arbitrary will of their master. One clause of the statute, however, seems to favour somewhat of the spirit of liberty. It was enacted, that the ecclesiastical commissioners should establish nothing repugnant to the laws and statutes of the realm. But in reality this proviso was inserted by the king, to serve his own purposes. By introducing a confusion and contradiction into the laws, he became more the master of every one's life and property; and as the ancient independence of the church still gave him jealousy, he was well pleased, under colour of such a clause, to introduce appeals from spiritual to civil courts. For the same reason he would never promulgate a body of canon law; and he encouraged the judges on all occasions to interpose in ecclesiastical causes, wherever they thought the law or the prerogative concerned. Being thus armed by the authority of parliament, or rather by their acknowledgment of his spiritual supremacy, the king employed his commissioners to select a system of tenets for the assent and belief of the nation. A small volume was published, under the title of *The Institution of a Christian Man*, which was received by the convocation, and made the infallible standard of orthodoxy. In this book the points of justification, faith, free-will, good works, and grace, were discussed in a manner somewhat favourable to the opinions of the reformers. The sacraments, which a few years before were only allowed to be three, were now increased to seven, conformably to the sentiments of the Catholics. Throughout the whole of this book the king's caprice is very discernible; and the book is in reality to be regarded as his composition. For Henry, while he made his opinion a rule for the nation, would himself submit to no authority whatever; not even to any which he had formerly established. The

275
Extreme
absurdity of
the king's
conduct.

England. same year the people had a farther instance of the king's inconsistency. He ordered a new book to be composed, called *The Erudition of a Christian Man*; and without asking the consent of the convocation, he published by his own authority this new model of orthodoxy. He was no less positive in his new creed than he had been in the old one; but though he required the faith of the nation to veer about at his signal, he was particularly careful to inculcate the doctrine of passive obedience in all his books, and he was no less careful to retain the nation in the practice.

But while the king was thus spreading his own books among the people, both he and the clergy seem to have been very much perplexed with regard to the scriptures. A review had been made by the ecclesiastical synod of the new translation of the Bible; and Bishop Gardiner had proposed, that instead of employing English expressions throughout, several Latin words should still be preserved, because they contained, as he pretended, such peculiar energy and significance, that they had no correspondent terms in the English tongue. Among these were *ecclesia*, *penitentia*, *pontifex*, *conventus*, &c. But as this mixture would appear extremely barbarous, and was plainly calculated for no other purpose than to retain the people in their ancient ignorance, the proposal was rejected. The knowledge of the people, however, seemed to be still more dangerous than their ignorance; and the king and parliament, soon after the publication of the scriptures, retracted the concession which they had formerly made, and prohibited all but gentlemen and merchants to peruse them. Even that liberty was not granted without an apparent hesitation, and dread of the consequences. These persons were allowed to read, *so it be done quietly and with good order*. And the preamble to the act sets forth, "That many seditious and ignorant persons had abused the liberty granted them of reading the Bible; and that great diversity of opinion, animosities, tumults, and schisms, had been occasioned by perverting the sense of the scriptures." The mass book also passed under the king's examination; but little alteration was yet made in it. Some doubtful or fictitious saints only were struck out; and the name of the pope was erased. The latter precaution was also used with every new book that was printed, and even every old one that was sold. The word *pope* was carefully omitted or blotted out; as if that precaution could abolish the term from the language, or cause the people forget that such a person existed. About this time also, the king prohibited the acting of plays, interludes, and farces, in derision of the popish superstitions; which the Protestants had been in use to practise: and this prohibition was in the highest degree pleasing to the Roman Catholics.

In this tyrannical and headstrong manner Henry proceeded with regard to ecclesiastical affairs. In other respects his conduct was equally violent. With regard to his domestic concerns, history scarce affords his parallel. We have already taken notice of his extreme love for Anne Boleyn, whom he married, contrary even to his own principles, before the marriage with Catharine was dissolved. His affection for the former was carried to such a height, that he even procured an act excluding from the succession the issue of Queen Catharine, in favour of the children of Anne.

Anne.

England.
276
The luc-
cession fet-
tled on the
children of
Anne Bo-
leyn.

Anne Boleyn; and failing them to the king's heirs for ever. An oath to this purpose was likewise enjoined, under penalty of imprisonment during the king's pleasure, and forfeiture of goods and chattles. All slander against the king and his new queen or their issue was subjected to the penalty of treason or imprisonment of treason. The reason given for this extreme severity toward his own child was, that her mother had obstinately refused to quit the kingdom, notwithstanding all the methods he could take to induce her to do so. The oath was generally taken throughout the kingdom; Sir Thomas More the chancellor, and Fisher bishop of Rochester, being the only persons who refused; for which both of them were imprisoned, and soon after executed. The unfortunate Queen Catharine died, in her retreat at Ampt-hill, in the year 1536. On her death-bed she wrote a most pathetic letter to the king, in which she for-gave him all the injuries she had received, and recom-mended to him in the strongest terms their daughter the princess Mary. This letter affected Henry so much, that he could not read it without tears; but the new queen is said to have exulted in such a man-ner on hearing of the death of her rival, as was quite inconsistent with either decency or humanity. Her triumph, however, was of short duration. Henry had no sooner possessed her, secure from every disquieting thought by the death of Queen Catharine, than his passion began to decline; and to this her delivery of a dead son did not a little contribute; for so impetuous and absurd were his passions, and such was his desire for male issue, that the disappointment in this respect alone was sufficient to alienate his affection from his wife. The levity of her temper, and her extreme gaiety of behaviour, bordering upon licentiousness, as related under the article **BOLEYN**, also gave an oppor-tunity to her enemies of inflaming the king's jealousy against her. The viscountess of Rochford, in parti-cular, a woman of profligate manners, and who was married to the queen's brother, had the cruelty to re-port to the king that her husband committed incest with his own sister; and, not content with this, she in-terpreted every instance of favour shown by her to a man, as proof of a criminal intercourse between them. At the same time it must not be forgot, that he who in-sisted on such rigid fidelity from his wives, was himself the most faithless of mankind. He had doubts, it may be allowed, about the legality of his marriage with Queen Catharine, but his doubts were evidently confirmed by the charms of Anne Boleyn. After being fatiated with the possession of her for six years, perhaps he really doubted her fidelity; but here again his doubts were confirmed by the beauty of Jane Seymour, with whom he had now fallen in love. It may easily be believed, that from this consideration alone there was no reason to hope that ever the unfortunate Anne would be able to exculpate herself. Had she really been guilty, her monster of a husband might have allowed her to live; but his cruelty was as unbounded and insatiable as his other perverse passions. She was condemned; and the sentence pronounced against her was, that she should be burned or beheaded at the king's pleasure. On hearing this dreadful denunciation, she exclaimed, "O Father! O Creator! thou who art the way, the truth, and the life! thou knowest that I have not deserved this fate." She then made the most solemn protestations of inno-

277
Indecent
behaviour
of the new
queen on
hearing of
the death of
Catharine.

278
The king's
affection
declines.

279
She is ac-
cused of
infidelity
to the king.

280
Henry's
love for
Jane Sey-
mour the
true cause
of Anne
Boleyn's
death.

cence before her judges; but these, as they had been from the beginning ineffectual, so it was not to be supposed that they could now avail any thing. Anne was beheaded by the executioner of Calais, who was reckoned more expert than any in England; and Henry enjoyed the pleasure of marrying his beloved Jane Seymour. His satisfaction, however, was of no long continuance; for the queen, becoming pregnant imme-diatly after marriage, died in two days after the birth of the child; who being a son, was baptized by the name of Edward VI. As this lady had been more be-loved by Henry than any of his other wives, his grief for the loss of her was extreme. However, it did not hinder him from entering very soon afterwards into a new matrimonial scheme; in which he met with many difficulties. His first proposals were made to the duchess dowager of Milan, niece to the em-peror and to Catharine his own former queen; but as he had behaved so indifferently to the aunt, it is scarcely to be supposed that his addressee could prove agreeable to the niece. On this he demanded the duchess-dowager of Longueville, daughter of the duke of Guise; but on making the proposal to the French monarch, Francis I. he was informed that the princess had been already betrothed to the king of Scotland. Henry, however, would take no refusal. He had learned that the object of his affection was endowed with many accomplishments, was very beau-tiful, and of a large size, which last property he look-ed upon to be necessary for him who was now be-come somewhat corpulent himself. Francis, to pre-vent any more solicitations on this subject, sent the princess to Scotland, but at the same time made Henry an offer of Mary of Bourbon, daughter of the duke of Vendome. This princess was rejected by Henry, because he had heard of her being formerly refused by the king of Scotland. He was then offered his choice of the two younger sisters of the queen of Scot-land, both of them being equal in merit as well as size to the one whom he had desired: but Henry, unwill-ing to trust to any reports concerning the beauty of these ladies, or even to their pictures, proposed to Fran-cis, that they should have a conference at Calais under pretence of business, and that the latter should bring with him the two princesses of Guise with the finest ladies of quality in France, that he might make a choice. This indelicate proposal shocked Francis: he returned for answer, that he was too much impressed with regard for the fair sex to carry ladies of the first quality, like geldings, to a market, to be chosen or re-jected according to the humour of the purchaser. Henry remonstrated and stormed as usual; but though Francis at this time earnestly wished to oblige him, he at last totally rejected the proposal. Negotiations were then entered into for a German match; and the prin-cess of Cleves was proposed by Cromwell, on account of the great interest her father had with the Protestant princes of Germany. Henry had also become enamoured of her person from a picture of her he had seen: but this, though drawn by an eminent artist, was unluckily done so much to the advantage, that when the negotiation was quite finished, and the bride arrived in England, he lost all patience, swearing that she was a great Flanders mare, and that he could never bear her the smallest affection. The matter was still worse, when he found that she

England.
281
Execution
of Anne
Bol yn, and
third mar-
riage of
Henry.

282
Queen Jane
dies in
child-bed
of Edward
VI.

283
Extrava-
gant beha-
viour of
the king
concerning
his fourth
marriage.

284
Marriage
with Anne
of Cleves.

England. could speak no language but Dutch, of which he was entirely ignorant. Notwithstanding all these objections, however, he resolved to complete the marriage, telling Cromwell, that, since he had gone so far, he must now put his neck into the yoke. The reason of this was, that the friendship of the German princes was now more than ever necessary for Henry; and it was supposed that the affront of sending the princess back to her own country might be resented. Cromwell, who knew that his own life depended on the event of the matter, was very anxious to learn from the king how he liked his spouse after having passed a night with her; but was struck with terror when he replied that he now hated her more than ever; that he was resolved not to cohabit with her, and even suspected that she was not a virgin; a matter in which he pretended to be a *connoisseur*, and about which he was extremely scrupulous. In a little time his aversion increased to such a degree, that he determined at any rate to get rid of his queen and prime minister both at once. Cromwell had long been an object of aversion to the nobility, who hated him on account of his obscure birth; his father being no other than a blacksmith, though the son had obtained the first employments in the kingdom. By his office of vicar-general, he had an almost absolute authority over the clergy; he was also lord privy-seal, lord-chamberlain, and master of the wards. He had also been invested with the order of the garter, and was created earl of Essex. This was sufficient to raise the envy of the courtiers: but he had also the misfortune to fall under the displeasure of both Protestants and Papists; the former hating him on account of his concurrence with Henry in their persecution, and the latter looking upon him as the greatest enemy of their religion. To these unfortunate circumstances on the part of Cromwell was added the usual situation of Henry himself, who had now fallen in love with Catharine Howard, niece to the duke of Norfolk; to enjoy whom, he now determined to divorce Anne of Cleves. By the insinuations of this lady and her uncle, Cromwell's ruin was accomplished; and he was condemned, not only without any trial, but even without examination. The charge was of heresy and high treason; but the instances of the latter were quite absurd and ridiculous. He submitted, however, to his sentence without murmuring, as knowing that his complaints on this subject would be revenged on his son. He was terribly mangled by the executioner before his head could be struck off. His death was soon followed by the dissolution of the marriage with the princess of Cleves, which was annulled by the consent of both parties. The princess parted from him with great indifference; and accepted of 3000*l.* a-year as a compensation, but refused to return to her own country after the affront she had received.

285
The marriage annulled, and Cromwell put to death.

286
Henry falls in love with Catharine Howard.

287
Infidelity and death of the new queen.

The king's marriage with Catharine Howard soon followed the dissolution of that with Anne of Cleves; but the event may surely be regarded as a providential punishment upon this tyrant, whose cruelty, lust, and other bad qualities, can scarcely be matched in history. We have already mentioned his insinuations against the virtue of the unfortunate princess of Cleves: these were amply repaid by the actual infidelities of his new queen,

whom we must suppose he believed to be a pure and perfect virgin at the time he married her. So happy indeed did he imagine himself in this new marriage, that he publicly returned thanks for his conjugal felicity, when a most unfortunate information concerning the queen's incontinence was given to Cranmer by one of the name of Lafcelles, whose sister had been servant to the duchess-dowager of Norfolk. He not only gave intelligence of her amours before marriage, but affirmed that she had continued the same criminal practices ever since. Two of her paramours were arrested, and confessed their crimes: the queen herself also confessed guilt before marriage, but denied having ever been false to the king's bed; which, however, had very little probability. She was beheaded on Tower-hill, along with the viscountess of Rochford, who had been a confidant in her amours. The latter, as has already been observed, was a principal instrument in procuring the destruction of the unhappy Anne Boleyn, and therefore died unpitied; while the virtuous character of that unfortunate lady received an additional confirmation from the discovery of this woman's guilt.

To secure himself from any farther disasters of this kind, Henry passed a most extraordinary law, enacting, that any one who should know, or strongly suspect, any guilt in the queen, might, within 20 days, disclose it to the king or council, without incurring the penalty of any former law against defaming the queen; though at the same time every one was prohibited from spreading the matter abroad, or even privately whispering it to others. It was also enacted, that if the king married any woman who had been incontinent, taking her for a true maid, she should be guilty of treason if she did not previously reveal her guilt to him.

These laws afforded diversion to the people, who now said that the king must look out for a widow; as no reputed maid would ever be persuaded to incur the penalty of the statute. This in truth happened to be the case at last; for about a year after the death of Catharine Howard, he married, for his sixth wife, Catharine Parr, widow of Nevil Lord Latimer. This lady, being somewhat inclined to the doctrines of the reformation, and having the boldness to tell her husband her mind upon the subject, had like to have shared the fate of the rest. The furious monarch, incapable of bearing the least contradiction, instantly complained to Bishop Gardiner, who inflamed the quarrel as much as possible; so that at last the king consented that articles of impeachment should be drawn up against her. But these were rendered abortive by the prudence and address of the queen, as related under the article PARR.

All this time Henry had tyrannized over his nobility in the most cruel manner. The old countess of Salisbury, the last of the house of Plantagenet, was executed with circumstances of great cruelty. She had been condemned, as usual, without any trial; and when she was brought to the scaffold, refused to lay her head on the block in obedience to a sentence, to the justice of which she had never consented. She told the executioner, therefore, that if he would have her head, he must win it the best way he could; and thus she ran about the scaffold, pursued by the executioner,

England.

288
Absurdity of the king.289
Sixth marriage with Catharine Parr, whom he intends also to put to death.290
Monstrous cruelty of the king.

England. tioner, who aimed many fruitless blows at her neck before he was able to put an end to her life. Soon after her, the lord Leonard Grey was likewise executed for treason, but we have very little account of this transaction.

291
Attainder
of Norfolk
and Surry.

The last instances of the king's injustice and cruelty were the duke of Norfolk and his son the earl of Surry. The former had served the king with fidelity, and the latter was a young man of the most promising hopes. His qualifications, however, were no security against the violence of Henry's temper. He had dropped some expressions of resentment against the king's ministers, who had displaced him from the government of Boulogne; and the whole family had become obnoxious on account of the late queen Catharine Howard. From these motives, orders were given to arrest both the father and son; and accordingly they were arrested both on the same day, and confined to the tower. The duchess-dowager of Richmond, Surry's own sister, was among the number of his accusers; and Sir Richard Southwell also, his most intimate friend, charged him with infidelity to the king. Surry denied the charge, and challenged his accuser to a single combat. This favour was denied him; and, notwithstanding his eloquent and spirited defence, he was condemned and executed at Tower-hill.—The duke of Norfolk vainly endeavoured to mollify the king by letters and submissions. An attainder was found against him, though the only crime his accusers could allege was, that he had once said that the king was sickly, and could not hold out long; and that the kingdom was likely to be torn between the contending parties of different persuasions. Cranmer, though engaged for many years in an opposite party to that of Norfolk, and though he had received many and great injuries from him, would have no hand in such an unjust prosecution; but retired to his seat at Croydon. The death-warrant, however, was made out, and immediately sent to the lieutenant of the tower; but a period was put to the cruelties and violence of the king by his death, which happened on the 14th of January 1547, the night before Norfolk was to have been executed.

292
Henry dies,
and is suc-
ceeded by
Edward VI.

Henry was succeeded by his only son Edward, a boy of nine years of age. The most remarkable transactions of his reign are those with regard to religion. The restraint which Henry VIII. had laid upon the Protestants was now taken off; and they not only maintained their doctrines openly, but soon became the prevailing party. Henry had fixed the majority of his son at 18 years of age; and, in the mean time, appointed 16 executors of his will, to whom, during the minority, he entrusted the government of the king and kingdom. This will, he imagined, would be obeyed as implicitly after his death as though he had been alive. But the first act of the executors was to choose the earl of Hertford, afterwards duke of Somerset, protector of the realm; and in him was lodged all the regal power, together with a privilege of naming whom he pleased for his privy council.

293
Reforma-
tion com-
pleted.

The duke of Somerset had long been reckoned a secret partisan of the reformers; and, immediately on his elevation to his present high dignity, began to express his intention of reforming the abuses of the ancient religion. Under his direction and that of Cran-

mer, therefore, the reformation was carried forward and completed. The only person of consequence who opposed the reformers was Gardiner bishop of Winchester; and, to the disgrace of their own principles, the reformers now showed that they could persecute as severely as the Papists had formerly persecuted them. Gardiner was committed to the Fleet prison, where he was treated with great severity. He was afterwards sent to the tower: and having continued there two years, he was commanded to subscribe several articles, among which was one confessing the justice of his own imprisonment. To all the articles but this he agreed to subscribe; but that did not give satisfaction. He was then committed to close custody; his books and papers were seized; all company was denied him, and he was not even permitted the use of pen and ink. The bishops of Chichester, Worcester, and Exeter, were in like manner deprived of their offices; but the bishops of Llandaff, Salisbury, and Coventry, escaped by sacrificing the most considerable share of their revenues. The libraries of Westminster and Oxford were ordered to be ransacked, and purged of the Romish legends, missals, and other superstitious volumes; in which search, great devastation was made even in useful literature. Many volumes clasped in silver were destroyed for the sake of their rich bindings; many of geometry and astronomy were supposed to be magical, and destroyed on that account; while the members of the university, unable to put a stop to these ravages, trembled for their own safety.

England.
294
The reform-
ers perse-
cute the Ca-
tholics.

The reformers, however, were not contented with severities of this kind. A commission was granted to the primate and others, to search after all Anabaptists, heretics, or contemners of the new liturgy. Among the numbers who were found guilty upon this occasion, was one Joan Boucher, commonly called *Joan of Kent*; who was so very obstinate, that the commissioners could make no impression upon her. She maintained an abstruse metaphysical sentiment, that Christ, as man, was a sinful man; but, as the Word, he was free from sin, and could be subject to none of the frailties of the flesh with which he was clothed. For maintaining this doctrine, the poor woman was condemned to be burnt to death as a heretic. The young king, who it seems had more sense than his teachers, refused at first to sign the death-warrant: but at last, being overcome by the importunities of Cranmer, he reluctantly complied; declaring, that if he did wrong, the sin should be on the head of those who had persuaded him to it. The primate, after making another unsuccessful effort to reclaim the woman from her opinions, committed her to the flames. Some time after, one Van Paris, a Dutchman, was condemned to death for Arianism. He suffered with so much satisfaction, that he hugged and caressed the faggots that were consuming him.

The rest of this reign affords only the history of intrigues and cabals of the courtiers one against another. The protector was first opposed by his own brother admiral Sir Thomas Seymour, who had married Catharine Parr the late king's widow. She died soon after the marriage; and he then made his addressee to the princess Elizabeth, who is said not to have been averse to the match. His brother the duke, who was at that time in the north, being informed of his

^{England.} His ambitious projects, speedily returned, had him attainted of high treason, and at last condemned and executed. The duke of Somerset himself, however, was some time afterwards deprived of his office by Dudley duke of Northumberland; who at last found means to get him accused of high treason, and executed. Not satisfied with the office of protector, which he assumed on the death of Somerset, this ambitious nobleman formed a scheme of engrossing the sovereign power altogether. He represented to Edward, who was now in a declining state of health, that his sisters Mary and Elizabeth, who were appointed by Henry's will to succeed, in failure of direct heirs, to the crown, had both been declared illegitimate by parliament; that the queen of Scots his aunt stood excluded by the king's will; and, being an alien also, lost all right of succeeding. The three princesses being thus excluded, the succession naturally devolved to the marchioness of Dorset, eldest daughter of the French queen, Henry's sister, who had married the earl of Suffolk after her first husband's death. The next heir to the marchioness was Lady Jane Grey, a lady universally respected, both on account of the charms of her person, and the virtues and endowments of her mind. The king, who was accustomed to submit to the politic views of this minister, agreed to have the succession submitted to council, where Northumberland hoped to procure an easy concurrence. The judges, however, who were appointed to draw up the king's letters patent for this purpose, warmly objected to the measure; and gave their reasons before the council. They begged that a parliament might be summoned, both to give it force, and to free its partisans from danger: they said that the form was invalid, and would not only subject the judges who drew it, but every counsellor who signed it, to the pains of treason. Northumberland could not brook their demurs; he threatened them with his authority, called one of them a *traitor*, and said he would fight with any man in his shirt in such a just cause as that of Lady Jane's succession. A method was therefore found out of screening the judges from danger, by granting them the king's pardon for what they should draw up; and at length the patent for changing the succession was completed, the princesses Mary and Elizabeth were set aside, and the crown settled on the heirs of the dukes of Suffolk (for she herself was contented to forego her claim.)

For some time the king had languished in a consumption. After this settlement of the crown, his health visibly declined every day, and little hopes were entertained of his recovery. To make matters worse, his physicians were dismissed by Northumberland's advice, and by an order of council; and he was put into the hands of an ignorant old woman, who undertook in a little time to restore him to health. After the use of her medicines all his bad symptoms increased to the most violent degree. He felt a difficulty of speech and breathing; his pulse failed, his legs swelled, his colour became livid, and many other signs of approaching death made their appearance. He expired at Greenwich on the 6th of July 1553, in the 16th year of his age and 7th of his reign.

After the death of King Edward, very little regard was paid to the new patent by which Lady Jane Grey

had been declared heir to the throne. The undoubted title of Mary, notwithstanding the scandalous behaviour of her father and his servile parliaments, was acknowledged by the whole nation. Northumberland, however, was resolved to put the late king's will in execution. He therefore carefully concealed the death of Edward, in hopes of securing the person of Mary, who by an order of council had been required to attend her brother during his illness; but she being informed of his death, immediately prepared to assert her right to the crown. Northumberland then, accompanied by the duke of Suffolk, the earl of Pembroke, and some other noblemen, saluted Lady Jane Grey queen of England. Jane was in a great measure ignorant of these transactions, and it was with the utmost difficulty she was persuaded to accept of the dignity conferred upon her. At last she complied, and suffered herself to be conveyed to the tower, where it was then usual for the sovereigns of England to pass some days after their accession. Mary, however, who had retired to Kenning-hall in Norfolk, in a very few days found herself at the head of 40,000 men; and Lady Jane resigned the sovereignty in ten days, with much more pleasure than she had received it. She retired with her mother to their own habitation; and Northumberland finding his affairs quite desperate, attempted to quit the kingdom. But he was stopped by the band of pensioner guards, who informed him that he must stay to justify their conduct in taking arms against their lawful sovereign. He therefore surrendered himself to Mary; and was soon after executed, together with Sir John Gates and Sir Thomas Palmer, two infamous tools of his power. Sentence was also pronounced against Lady Jane Grey and her husband Lord Guildford; but without any intention of putting it in execution against them at present, as their youth and innocence pleaded so strongly in their favour, neither of them having yet reached their 17th year.

Mary now entered London, and was peaceably settled on the throne without any effusion of blood. ²⁹⁷ The English, however, soon found reason to repent their attachment to her cause. Though she had at first solemnly promised to defend the religion and laws of her predecessor, she no sooner saw herself firmly established on the throne, than she resolved to restore the Popish religion, and give back their former power to the clergy. Gardiner, Bonnar, and the other bishops who had been imprisoned or suffered loss during the last reign, were taken from prison, reinstated in their sees, and now triumphed in their turn. On pretence of discouraging controversy, the queen by her prerogative silenced all preachers throughout England, except such as should obtain a particular license, and this she was resolved to give only to those of her own persuasion. The greater part of the foreign Protestants took the first opportunity of leaving the kingdom; and many of the arts and manufactures, which they had successfully introduced, fled with them. Soon after, the queen called a parliament, which seemed willing to concur in all her measures. They at once repealed all the statutes with regard to religion that had passed during the reign of Edward VI. and the national religion was again placed on the same footing in which it had been at the death of Henry VIII.

To strengthen the cause of the Catholics, and give the

295
Lady Jane
Gray declared
heir to
the crown.

297
Lady Jane
Gray placed
on the
throne, but
is forced to
resign it.

298
Mary de-
clared
queen.

296
Death of
Edward VI.

²⁹⁹ ^{England.} the queen more power to establish the religion to which she was so much attached, a proper match was to be sought for her; and it was supposed that three had already been proposed as candidates for her favour. Her affection seemed to be engaged by the earl of Devonshire: but as he was rather attached to the princess Elizabeth, he received the overtures which were made him from the queen with neglect. The next person mentioned as a proper match for her was Cardinal Pole, a man greatly respected for his virtues; but as he was now in the decline of life, Mary soon dropped all thoughts of that alliance. At last she cast her eye on Philip II. of Spain, son to the emperor Charles V. He was then in the 27th year of his age, and consequently agreeable in that respect to Mary, who was in her 48th year; but when her intentions with regard to this match became known, the greatest alarm took place throughout the whole nation. The commons presented such a strong remonstrance against a foreign alliance, that the queen thought proper to dissolve the parliament in order to get quit of their importunity. To obviate, however, all clamour, the articles of marriage were drawn up as favourably as possible for the interests of England. It was agreed, that though Philip should have the title of king, the administration should be entirely in the queen; that no foreigner should be capable of holding any office in the kingdom; nor should any innovation be made in the laws, customs, and privileges of the people; that Philip should not carry the queen abroad without her consent, or any of her children without the consent of the nobility. Sixty thousand pounds a-year were to be settled upon her as a jointure; and the male issue of this marriage were to inherit Burgundy and the Low Countries as well as the crown of England: and in case of the death of Don Carlos, Philip's son by his former marriage, without any heir, the queen's issue should inherit all the rest of the Spanish dominions also.

³⁰⁰ Alliance with Spain generally disagreeable.

³⁰¹ Wyatt's insurrection.

³⁰² He is condemned and executed with many of his followers.

All these concessions, however, were not sufficient to quiet the apprehensions of the people: they were considered merely as words of course, which might be retracted at pleasure; and the whole nation murmured loudly against a transaction so dangerous to its ancient liberty and independence. An insurrection was raised by Sir Thomas Wyatt, a Roman Catholic, at the head of 4000 men, who set out from Kent to London, publishing a declaration against the Spanish match and the queen's evil counsellors. Having advanced as far as Southwark, he required that the queen should put the tower of London into his hands; that she should deliver four counsellors as hostages; and, in order to ensure the liberty of the nation, should marry an Englishman. But his force was at present by far too small to support such magnificent pretensions; and he unluckily waited so much time without attempting any thing of importance, that the popular ferment entirely subsided, his followers abandoned him gradually, and he was at last obliged to surrender himself to Sir Maurice Berkeley near Temple-bar. His followers were treated with great cruelty: no fewer than 400 of them suffered by the hand of the executioner; 400 more were conducted with ropes about their necks into the queen's presence, and there received their

^{England.} pardon. Wyatt himself was condemned and executed.

This rebellion had almost proved fatal to the Princess Elizabeth, who for some time past had been treated with great severity by her sister. Mary, who possessed a most malignant and cruel heart, had never forgotten the quarrel between their mothers; and when a declaration was made after her own accession, recognising Queen Catharine's marriage as legal, she was thus furnished with a pretence for accounting Elizabeth illegitimate. She was likewise obnoxious on account of her religion, which Elizabeth at first had not prudence sufficient to conceal; though afterwards she learned full well to disguise her sentiments. But, above all, her standing so high in the affection of the earl of Devonshire, was a crime not to be forgiven; and Mary made her sensible of her displeasure by numberless mortifications. She was ordered to take place at court after the duchess of Suffolk and the countess of Lennox; to avoid which, and other indignities, Elizabeth at last retired from court altogether into the country. After the suppression of Wyatt's rebellion she was committed to the tower, and underwent a strict examination before the council; but as Wyatt had made a declaration on the scaffold that she was in no manner of way concerned, the queen found herself under a necessity of releasing her. To get rid of such a troublesome rival, however, she was offered in marriage to the duke of Savoy; and on Elizabeth's declining the proposal, she was committed close prisoner to Woodstocke. The rebellion proved fatal, however, to many persons of distinction, and gave the queen an opportunity of manifesting that unbounded cruelty which reigned in her heart. The tower, and all the prisons in the kingdom, were filled with nobility and gentry, who became objects of royal vengeance, more on account of their credit and interest with the people than any concern they were supposed to have had with Wyatt. Sir Nicholas Throgmorton was tried in Guildhall; but as no satisfactory evidence appeared against him, the jury gave a verdict in his favour. The queen was so much enraged at this disappointment, that she recommended him to the tower, summoned the jury before the council, and at last sent them all to prison, fining them afterwards some of 1000l. and others of 2000l. each. Sir John Throgmorton, brother to Sir Nicholas just mentioned, was condemned and executed upon evidence which had been already rejected as insufficient. But of all those who perished on this occasion, none excited more universal compassion than the unfortunate Lady Jane Grey and her husband Lord Guilford Dudley. They had already received sentence of death, as has been mentioned; and two days after the execution of Wyatt, they received orders to prepare for eternity. Lady Jane, who had been in expectation of this blow, was no way intimidated, but received the news with the most heroic resolution. The place intended at first for their execution was Tower-hill; but the council, dreading the effects of the people's compassion for their youth, beauty, and innocence, gave directions that they should be beheaded within the verge of the tower. The duke of Suffolk was soon after tried, condemned, and executed; but would have met with more compassion, had not his ambitious

³⁰³ Princess Elizabeth harshly treated.

³⁰⁴ Executioners of Lady Jane Grey and her husband.

England.

305
The people
disarmed.

ambition been the cause of his daughter's unhappy fate just mentioned. Sir Thomas Grey also lost his life on the same account; but the cruel spirit of Mary was still unsatisfied; and finding herself universally odious, that she might free herself from any apprehensions for what was past, as well as tyrannize with the more freedom in time to come, she disabled the people from resistance, by ordering general musters, and causing the commissioners seize their arms and lay them up in forts and castles.

306
Marriage.
with Philip
solemnized.

Notwithstanding this unpopularity, however, the rebellion of Wyatt had so strengthened the hands of government, that a parliament was assembled in hopes of gratifying the queen's wishes in regard to her marriage with Philip of Spain. To facilitate this purpose also, the emperor of Germany sent over to England 400,000 crowns to be distributed among the members of parliament in bribes and pensions; a practice of which there had hitherto been no example in England. The queen, notwithstanding her bigotry, refused the title of *Supreme Head of the Church*, which she had dropped three months before. Gardiner made a speech, in which he proposed, that they should invest the queen with a legal power of disposing of the crown, and appointing her successor; but the parliament, however obsequious in other respects, did not choose to gratify their sovereign in a measure by which the kingdom of England might become a province of the Spanish monarchy. They would not even declare it treason to imagine or attempt the death of the queen's husband during her life-time, though they agreed to ratify the articles of marriage. Finding therefore that the parliament even yet was not sufficiently obsequious, it was thought most proper to dissolve them. Soon after this the marriage with Philip was solemnized; but as the latter had espoused his queen merely with a view to become king of England, he no sooner found himself disappointed in this than he showed a total want of affection for her as a wife. He passed most of his time at a distance from her in the Low Countries; and seldom wrote to her except when he wanted money, with which Mary would at all times gladly have supplied him even had it been at the expence of her kingdom, if in her power.

307
Protestants
persecuted.

The enemies of the state being supposed to be suppressed, those of the Protestant religion were next persecuted. The old sanguinary laws which had been rejected by a former parliament were now revived. Orders were given, that the priests and bishops who had married should be ejected; that the mass should be restored, and the pope's authority established; and that the church and its privileges, all but their goods and estates, should be put on the same footing on which they were before the commencement of the reformation. But as the gentry and nobility had already divided the churchlands among them, it was though inconvenient, and indeed impossible, to make a restoration of these. The persons who chiefly promoted these measures were Gardiner bishop of Winchester, and Cardinal Pole, who was a kinsman of Henry VIII. but had been long in Italy, and was now returned from it. The latter was for tolerating the Protestants; but the former, perceiving that rigorous measures would be most agreeable to the king and queen, declared himself against it. He was too prudent, however, to appear in person at the

head of the persecution; and therefore assigned that office to Bonnar bishop of London, a man of a very abandoned character. The bloody scene began by the execution of Hooper bishop of Gloucester, and Rogers prebendary of St Paul's. These were quickly followed by others, of whom the principal were Archbishop Cramer, Ridley bishop of London, and Latimer bishop of Worcester*. These persecutions soon became odious to the whole nation, and the perpetrators of them were all willing to throw the blame from themselves upon others. Philip endeavoured to fasten the whole reproach upon Bonnar; but that bishop would not take the whole, and therefore retorted on the court. A bold step was now taken to introduce a court similar to the Spanish inquisition, that should be empowered to try heretics, and condemn them without any other law but its own authority. But even this was thought a method too dilatory in the present exigence of affairs. A proclamation issued against books of heresy, treason, and sedition, declared, that whosoever had such books in his possession, and did not burn them without reading, should suffer as a rebel. This was attended with the execution of such numbers, that at last the magistrates who had been instrumental in these cruelties refused to give their assistance any longer. It was computed, that during this persecution, 277 persons suffered by fire, besides those punished by imprisonments, fines, and confiscations. Among those who suffered by fire were 5 bishops, 21 clergymen, 8 lay-gentlemen, 84 tradesmen, 100 husbandmen, 55 women, and 4 children.

The only remarkable transaction which happened during this reign with regard to the temporal affairs of the kingdom was the loss of Calais, which had been in the possession of the English for upwards of 200 years †. This loss filled the whole kingdom with complaints, and the queen with grief. She was heard to say, that, when dead, the name of *Calais* would be found engraven on her heart. She did not long survive this loss; but died in the year 1558, of a lingering illness, after a reign of five years four months and eleven days.

308
Mary dies,
and is suc-
ceeded by
Elizabeth.

After the death of Mary, the princess Elizabeth succeeded to the throne without opposition. She was at Hatfield when news of her sister's death were brought her; upon which she hastened up to London, where she was received with great joy. This princess was well qualified for government. She had judgment sufficient to make choice of proper ministers, and authority enough to keep her subjects in awe. The restraints also, to which she had been subjected during her sister's reign, had taught her so well to conceal her sentiments, that she had become a perfect mistress of dissimulation; which, though no commendable part of her character, proved occasionally of great service to her government. She perfected the reformation, and put the religion of England upon the same plan which subsists at present. This was accomplished without the least difficulty; for the persecutions in Mary's reign had served only to give the whole nation an aversion for popery. In the time of Edward VI. the people had been compelled to embrace the Protestant religion, and their fears induced them to conform; but now, almost the whole nation were Protestants from inclination. The reformation was confirmed by act of parliament in 1559, and

thus

England. thus England was seen to change its religion four times in the space of 32 years.

309
Peace with
France.

During the time that the queen and her counsellors were employed in settling the religious affairs of the nation, negotiations were likewise carried on for a peace between England and France; which was at last concluded on the following terms, viz. that Henry should restore Calais at the expiration of eight years; that in case of failure, he should pay 500,000 crowns, and Elizabeth's title to Calais still remain; that for the payment of this sum he should find the security of eight foreign merchants, not natives of France; and until that security were provided he should deliver five hostages. If during this interval Elizabeth should break the peace with France or Scotland, she should forfeit all title to Calais; but if Henry made war on Elizabeth, he should be obliged to restore the fortrefs immediately. This pacification was soon followed by an irreconcilable quarrel with Mary queen of Scotland; which was not extinguished but by the death of the Scottish princefs; and that with such circumstances of accumulated treachery, hypocrisy, and dissimulation, as have stamped an indelible disgrace on the memory of Elizabeth. See the articles MARY and SCOTLAND.

310
Preparations for
war with
Spain.

Elizabeth having at last got rid of her rival in the year 1587, began to make preparations for resisting the Spanish invasion. Hearing that Philip was secretly fitting out a great navy to attack her, she sent Sir Francis Drake with a fleet to pillage his coasts and destroy his shipping. On this expedition he set sail with four capital ships furnished by the queen, and 26 others of various sizes furnished him by the merchants of London in hopes of sharing the plunder. Having learned that a Spanish fleet richly laden was lying at Cadiz in readiness to set sail for Lisbon, he directed his course towards the former port, where he boldly attacked the enemy. Six galleys were obliged to take shelter under the cannon of the forts; he burned about 100 vessels laden with ammunition and naval stores; and destroyed a great ship belonging to the marquis de Santa Croce. Thence setting sail for Cape St Vincent, he took by assault the castle situated on that promontory, with three other fortresses. Having next insulted Lisbon, he sailed to the island Tercera, one of the Azores, where, after lying in wait for some time, he took a rich prize, and then returned to England; having by this short expedition taught the English to despise the huge and unwieldy ships of the enemy, and thus prepared them to act with more resolution against the formidable armament that now threatened to invade them.

311
Exploits of
Sir Francis
Drake.

312
Miscarriage of
Philip's
scheme of
an invasion.

But though the expedition of Sir Francis Drake had retarded the intended invasion of England for a twelvemonth, it had not by any means induced Philip to abandon his design. During that interval he continued his preparations with the greatest assiduity, the more especially as the invasion of England seemed to be a necessary preparative for regaining his authority over the Netherlands, the revolted provinces having been strongly supported by Elizabeth. The fleet prepared at this time was superior to any thing then existing in the world; and no doubt being entertained of its success, it was ostentatiously styled the *Invincible Armada*. The miserable event of this expedition, and the total failure of all the mighty hopes of Philip, are related under the article ARMADA. The spirit and courage of the

VOL. VIII. Part I.

English were now excited to attempt invasions in their turn; which they executed in numerous descents on the Spanish coasts; though these were only temporary, and designed not for permanent conquest, but to harass the enemy. It would be endless to relate all the advantages obtained over the enemy at sea, where the capture of every ship must have been a separate narrative. It is sufficient to observe, that the sea-captains of that reign are still considered as the boldest and most enterprising set of men that England ever produced; and among this number we are to reckon Raleigh and Howard, Drake, Cavendish, and Hawkins. The English navy then began to take the lead; and has since continued irresistible in all parts of the ocean.

England.

Elizabeth continued to reign with great glory till the year 1603; but all her greatness could not prevent her from being extremely miserable before her death. She had caused her greatest favourite, and probably her lover, the earl of Essex †, to be executed. Though † See *Deve-*
this execution could not be called unjust, the queen's *reux.*
affection (on being informed that he had at last thrown himself entirely on her clemency) returned to such a degree, that she thenceforth gave herself entirely over to despair. She refused food and sustenance; she continued silent and gloomy; sighs and groans were the only vent she gave to her despondence; and she lay for ten days and nights upon the carpet, leaning on cushions, which her maids brought her. Perhaps the faculties of her mind were impaired by long and violent exercise; perhaps she reflected with remorse on some past actions of her life, or perceived, but too strongly, the decays of nature, and the approach of her dissolution. She saw her courtiers remitting in their assiduity to her, in order to pay their court to James the apparent successor. Such a concurrence of causes was more than sufficient to destroy the remains of her constitution; and her end was now visibly seen to approach. Feeling a perpetual heat in her stomach, attended with an unquenchable thirst, she drank without ceasing, but refused the assistance of her physicians. Her distemper gaining ground, Cecil and the lord admiral desired to know her sentiments with regard to the succession. To this she replied, that as the crown of England had always been held by kings, it ought not to devolve upon any inferior character, but upon her immediate heir the king of Scotland. Being then advised by the archbishop of Canterbury to fix her thoughts upon God, she replied, that her thoughts did not in the least wander from him. Her voice soon after left her; she fell into a lethargic slumber, which continued some hours; and she expired gently without a groan, in the 70th year of her age, and 45th of her reign. She was succeeded by James I. king of Scotland; since which time, the history of both England and Scotland is comprehended under the article BRITAIN.

513
Grief and
miserery of
Elizabeth.

314
Her death.

Since the Norman conquest, England has been divided into six circuits, each circuit containing a certain number of counties. Two judges are appointed for each circuit, which they visit in the spring and autumn, for administering justice to the subjects who are at a distance from the capital. In holding the lent (or spring) assizes, the northern circuit extends only to York and Lancaster; the assizes at Durham, Newcastle, Carlisle, and Appleby, being held only in the autumn,

England. autumn, and distinguished by the appellation of the *long circuit*. These circuits and counties are:

1. *Home Circuit* contains the counties of Essex, Hertford, Kent, Surry, and Suffex.
2. *Norfolk Circuit* contains those of Bucks, Bedford, Huntingdon, Cambridge, Suffolk, and Norfolk.
3. *Oxford Circuit*. Oxon, Berks, Gloucester, Worcester, Monmouth, Hereford, Salop, and Stafford.
4. *Midland Circuit*. Warwick, Leicester, Derby, Nottingham, Lincoln, Rutland, and Northampton.
5. *Western Circuit*. Hants, Wilts, Dorset, Somerset, Devon, and Cornwall.
6. *Northern Circuit*. York, Durham, Northumberland, Lancafter, Westmorland, and Cumberland.

Middlesex and Cheshire are not comprehended in the above circuits; the former being the seat of the supreme courts of justice, and the latter a county palatine. There is still a court of chancery in Lancafter and Durham, with a chancellor; and there is a court of exchequer at Chester, of a mixed kind, both for law and equity, of which the chamberlain of Chester is judge: there are also other justices in the counties palatine, to determine civil actions and pleas of the crown.

Besides the 40 counties into which England is divided, there are counties corporate, consisting of certain districts, to which the liberties and jurisdictions peculiar to a county have been granted by charter from the throne. Thus the city of London is a county distinct from Middlesex; the cities of York, Chester, Bristol, Norwich, Worcester, and the towns of Kingston upon Hull and Newcastle upon Tyne, are counties of themselves, distinct from those in which they lie. The same may be said of Berwick upon Tweed, which lies in Scotland, and has within its jurisdiction a small territory of two miles on the north side of the river. Under the name of a *town*, boroughs and cities are contained: for every borough or city is a town, though every town is not a borough or city.—An account of the English constitution and government is given under the articles KING, LORDS, COMMONS, PARLIAMENT, LAW, LIBERTY, RIGHTS, &c.

316
Religion.

The established religion of England is Episcopacy. Since the reign of Henry VIII. the sovereigns of England have been called, in public writs, the supreme heads of the church; but this title conveys no spiritual meaning, as it only denotes the regal power to prevent any ecclesiastical differences, or, in other words, to substitute the king in place of the pope before the reformation, with regard to temporalities and the internal economy of the church. The kings of England never intermeddle in ecclesiastical disputes, and are contented to give a sanction to the legal rights of the clergy.

The church of England, under this description of the monarchical power over it, is governed by two archbishops, and 24 bishops, besides the bishop of Sodor and Man, who, not being possessed of an English barony, does not sit in the house of peers. See ARCHBISHOP and BISHOP.

England contains about 60 archdeacons. Subordinate to them are the rural deacons, formerly styled *archpresbyters*, who signify the bishop's pleasure to his clergy, the lower class of which consists of parish-priests (who are called *rectors* or *vicars*), deacons and

curates. See the articles CURATE, DEACON, PARSON, England. and VICAR.

The following is a list of the English bishops, ³¹⁷ with their revenues, as charged in the king's books; of the ^{Revenues} though that sum is far from being the real annual value of the fee, yet it affords a comparative estimate between the revenues of each see with those of another.

ARCHBISHOPS.		L.	s.	d.
Canterbury,	- - -	2682	12	2
York,	- - -	1610	0	0
BISHOPS.				
London,	- - -	2000	0	0
Durham,	- - -	1821	1	3
Winchester,	- - -	3124	12	8
These three bishops take precedence of all others in England, and the others according to the seniority of their consecrations.				
Ely,	- - -	2134	18	6
Bath and Wells,	- - -	533	1	3
Hereford,	- - -	768	11	0
Rocheſter,	- - -	358	4	9
Litchfield and Coventry,	- - -	559	17	3
Cheſter,	- - -	420	1	8
Worceſter,	- - -	929	13	3
Chicheſter,	- - -	677	1	3
St Aſaph,	- - -	187	11	8
Salisbury,	- - -	1385	5	0
Bangor,	- - -	131	16	3
Norwich,	- - -	834	11	7
Glouceſter,	- - -	315	7	3
Llandaff,	- - -	154	14	2
Lincoln,	- - -	894	18	1
Briſtol,	- - -	297	11	0
Carlisle,	- - -	531	4	9
Exeter,	- - -	500	0	0
Peterborough,	- - -	414	14	8
Oxford,	- - -	381	11	0
St Davids,	- - -	426	2	1

The ecclesiastical government of England is, properly speaking, lodged in the convocation; which is a national representative or synod, and answers pretty near to the ideas we have of a parliament. They are convoked at the same time with every parliament; and their business is to consider of the state of the church, and to call those to an account who have advanced new opinions, inconsistent with the doctrines of the church of England. Some high-flying clergymen during the reign of Queen Anne, and in the beginning of that of George I. raised the powers of the convocation to a height that was inconsistent with the principles of religious toleration, and indeed of civil liberty: so that the crown was obliged to exert its prerogative of calling the members together, and of dissolving them; and ever since they have not been permitted to sit for any time, in which they could do business.

The following table exhibits a view of the population of England, taken from the returns made to the house of commons in consequence of an act of parliament which was passed for the purpose of ascertaining the number of inhabitants in the kingdom. From this table it appears that the total number of persons in England amounts to 8,331,434.

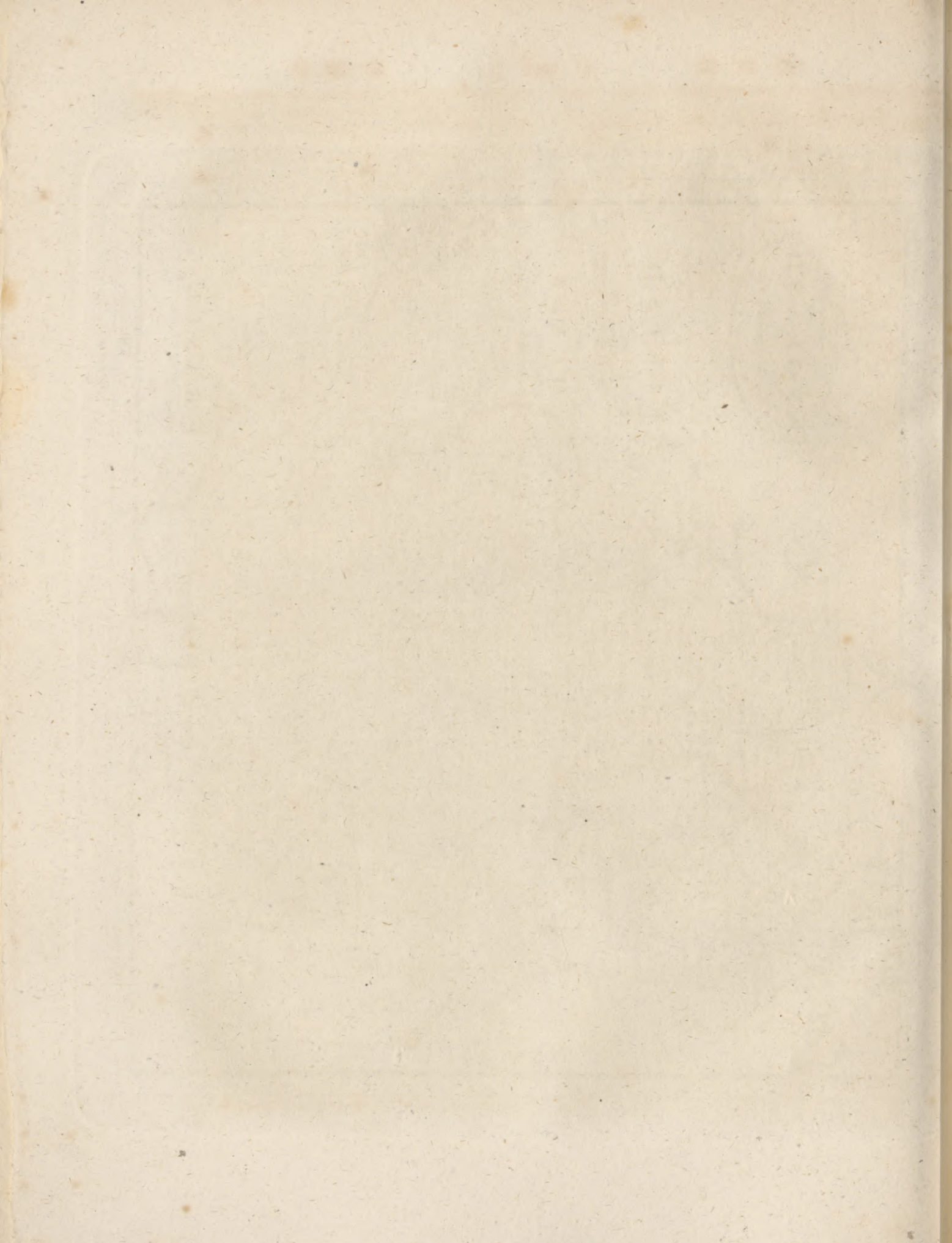
COUNTIES.



Deg. West from 7 London 6
 5
 4
 3
 2
 1
 0
 1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25
 26
 27
 28
 29
 30
 31
 32
 33
 34
 35
 36
 37
 38
 39
 40
 41
 42
 43
 44
 45
 46
 47
 48
 49
 50
 51
 52
 53
 54
 55
 56
 57
 58
 59
 60
 61
 62
 63
 64
 65
 66
 67
 68
 69
 70
 71
 72
 73
 74
 75
 76
 77
 78
 79
 80
 81
 82
 83
 84
 85
 86
 87
 88
 89
 90
 91
 92
 93
 94
 95
 96
 97
 98
 99
 100
 101
 102
 103
 104
 105
 106
 107
 108
 109
 110
 111
 112
 113
 114
 115
 116
 117
 118
 119
 120
 121
 122
 123
 124
 125
 126
 127
 128
 129
 130
 131
 132
 133
 134
 135
 136
 137
 138
 139
 140
 141
 142
 143
 144
 145
 146
 147
 148
 149
 150
 151
 152
 153
 154
 155
 156
 157
 158
 159
 160
 161
 162
 163
 164
 165
 166
 167
 168
 169
 170
 171
 172
 173
 174
 175
 176
 177
 178
 179
 180
 181
 182
 183
 184
 185
 186
 187
 188
 189
 190
 191
 192
 193
 194
 195
 196
 197
 198
 199
 200
 201
 202
 203
 204
 205
 206
 207
 208
 209
 210
 211
 212
 213
 214
 215
 216
 217
 218
 219
 220
 221
 222
 223
 224
 225
 226
 227
 228
 229
 230
 231
 232
 233
 234
 235
 236
 237
 238
 239
 240
 241
 242
 243
 244
 245
 246
 247
 248
 249
 250
 251
 252
 253
 254
 255
 256
 257
 258
 259
 260
 261
 262
 263
 264
 265
 266
 267
 268
 269
 270
 271
 272
 273
 274
 275
 276
 277
 278
 279
 280
 281
 282
 283
 284
 285
 286
 287
 288
 289
 290
 291
 292
 293
 294
 295
 296
 297
 298
 299
 300
 301
 302
 303
 304
 305
 306
 307
 308
 309
 310
 311
 312
 313
 314
 315
 316
 317
 318
 319
 320
 321
 322
 323
 324
 325
 326
 327
 328
 329
 330
 331
 332
 333
 334
 335
 336
 337
 338
 339
 340
 341
 342
 343
 344
 345
 346
 347
 348
 349
 350
 351
 352
 353
 354
 355
 356
 357
 358
 359
 360
 361
 362
 363
 364
 365
 366
 367
 368
 369
 370
 371
 372
 373
 374
 375
 376
 377
 378
 379
 380
 381
 382
 383
 384
 385
 386
 387
 388
 389
 390
 391
 392
 393
 394
 395
 396
 397
 398
 399
 400
 401
 402
 403
 404
 405
 406
 407
 408
 409
 410
 411
 412
 413
 414
 415
 416
 417
 418
 419
 420
 421
 422
 423
 424
 425
 426
 427
 428
 429
 430
 431
 432
 433
 434
 435
 436
 437
 438
 439
 440
 441
 442
 443
 444
 445
 446
 447
 448
 449
 450
 451
 452
 453
 454
 455
 456
 457
 458
 459
 460
 461
 462
 463
 464
 465
 466
 467
 468
 469
 470
 471
 472
 473
 474
 475
 476
 477
 478
 479
 480
 481
 482
 483
 484
 485
 486
 487
 488
 489
 490
 491
 492
 493
 494
 495
 496
 497
 498
 499
 500
 501
 502
 503
 504
 505
 506
 507
 508
 509
 510
 511
 512
 513
 514
 515
 516
 517
 518
 519
 520
 521
 522
 523
 524
 525
 526
 527
 528
 529
 530
 531
 532
 533
 534
 535
 536
 537
 538
 539
 540
 541
 542
 543
 544
 545
 546
 547
 548
 549
 550
 551
 552
 553
 554
 555
 556
 557
 558
 559
 560
 561
 562
 563
 564
 565
 566
 567
 568
 569
 570
 571
 572
 573
 574
 575
 576
 577
 578
 579
 580
 581
 582
 583
 584
 585
 586
 587
 588
 589
 590
 591
 592
 593
 594
 595
 596
 597
 598
 599
 600
 601
 602
 603
 604
 605
 606
 607
 608
 609
 610
 611
 612
 613
 614
 615
 616
 617
 618
 619
 620
 621
 622
 623
 624
 625
 626
 627
 628
 629
 630
 631
 632
 633
 634
 635
 636
 637
 638
 639
 640
 641
 642
 643
 644
 645
 646
 647
 648
 649
 650
 651
 652
 653
 654
 655
 656
 657
 658
 659
 660
 661
 662
 663
 664
 665
 666
 667
 668
 669
 670
 671
 672
 673
 674
 675
 676
 677
 678
 679
 680
 681
 682
 683
 684
 685
 686
 687
 688
 689
 690
 691
 692
 693
 694
 695
 696
 697
 698
 699
 700
 701
 702
 703
 704
 705
 706
 707
 708
 709
 710
 711
 712
 713
 714
 715
 716
 717
 718
 719
 720
 721
 722
 723
 724
 725
 726
 727
 728
 729
 730
 731
 732
 733
 734
 735
 736
 737
 738
 739
 740
 741
 742
 743
 744
 745
 746
 747
 748
 749
 750
 751
 752
 753
 754
 755
 756
 757
 758
 759
 760
 761
 762
 763
 764
 765
 766
 767
 768
 769
 770
 771
 772
 773
 774
 775
 776
 777
 778
 779
 780
 781
 782
 783
 784
 785
 786
 787
 788
 789
 790
 791
 792
 793
 794
 795
 796
 797
 798
 799
 800
 801
 802
 803
 804
 805
 806
 807
 808
 809
 810
 811
 812
 813
 814
 815
 816
 817
 818
 819
 820
 821
 822
 823
 824
 825
 826
 827
 828
 829
 830
 831
 832
 833
 834
 835
 836
 837
 838
 839
 840
 841
 842
 843
 844
 845
 846
 847
 848
 849
 850
 851
 852
 853
 854
 855
 856
 857
 858
 859
 860
 861
 862
 863
 864
 865
 866
 867
 868
 869
 870
 871
 872
 873
 874
 875
 876
 877
 878
 879
 880
 881
 882
 883
 884
 885
 886
 887
 888
 889
 890
 891
 892
 893
 894
 895
 896
 897
 898
 899
 900
 901
 902
 903
 904
 905
 906
 907
 908
 909
 910
 911
 912
 913
 914
 915
 916
 917
 918
 919
 920
 921
 922
 923
 924
 925
 926
 927
 928
 929
 930
 931
 932
 933
 934
 935
 936
 937
 938
 939
 940
 941
 942
 943
 944
 945
 946
 947
 948
 949
 950
 951
 952
 953
 954
 955
 956
 957
 958
 959
 960
 961
 962
 963
 964
 965
 966
 967
 968
 969
 970
 971
 972
 973
 974
 975
 976
 977
 978
 979
 980
 981
 982
 983
 984
 985
 986
 987
 988
 989
 990
 991
 992
 993
 994
 995
 996
 997
 998
 999
 1000

Map of Great Britain and Ireland, showing county boundaries and major cities.

Minutes of Time XXXII West from London VIII



England,
New
England.

England,
New
England.

COUNTIES.	HOUSES.		PERSONS.		OCCUPATIONS.		Total of Persons.
	Inhabited.	By how many Families occupied.	Males.	Females.	Persons chiefly employed in Agriculture.	Ditto in Trade Manufactures, or Handicraft.	
Bedford	11,888	13,980	30,523	32,870	18,766	13,816	63,393
Berks	20,573	23,416	52,821	56,394	38,155	16,921	109,215
Buckingham	20,443	23,384	52,094	55,354	25,083	20,138	107,444
Cambridge	16,139	19,262	44,031	45,265	23,054	11,988	89,346
Chester	34,482	37,613	92,759	98,992	38,823	67,447	191,751
Cornwall	32,906	39,040	89,868	98,401	42,687	24,870	188,269
Cumberland	21,573	25,893	54,377	62,853	21,062	18,387	117,230
Derby	31,822	33,660	79,401	81,471	31,743	39,516	161,142
Devon	57,955	72,559	157,240	185,761	96,208	60,844	343,001
Dorset	21,437	24,142	53,667	61,652	28,204	22,259	115,319
Durham	27,195	38,109	74,770	85,591	18,217	25,208	160,361
Essex	38,371	46,784	111,356	115,081	65,174	25,283	226,437
Gloucester	46,457	55,133	117,180	133,629	49,420	49,645	250,809
Hereford	17,003	18,822	43,955	45,236	31,261	8,588	89,191
Hertford	17,681	20,092	48,063	49,514	20,611	12,861	97,577
Huntingdon	6,841	8,150	18,521	19,047	9,536	4,484	37,568
Kent	51,585	65,967	151,374	156,250	54,124	43,253	307,624
Lancaster	114,270	132,147	322,356	350,375	52,018	269,259	672,731
Leicester	25,992	27,967	63,943	66,138	23,823	42,036	130,081
Lincoln	41,395	42,629	102,445	106,112	60,584	24,263	208,557
Middlesex	112,912	199,854	373,655	444,474	43,417	162,260	818,129
Monmouth	8,948	9,903	22,173	23,409	12,871	5,540	45,582
Norfolk	47,617	57,930	129,842	143,529	61,791	38,181	273,371
Northampton	26,665	29,361	63,417	68,340	29,303	31,426	131,757
Northumberland	26,518	35,503	73,357	83,744	23,190	25,738	157,101
Nottingham	25,611	30,081	68,558	71,792	23,904	35,513	140,350
Oxford	20,599	23,750	53,786	55,834	33,109	16,346	109,620
Rutland	3,274	3,563	7,978	8,378	3,995	1,923	16,356
Salop	31,182	34,501	82,563	85,076	45,046	35,535	167,639
Somerset	48,040	57,013	126,927	146,823	61,434	54,053	273,750
Southampton	38,345	45,331	105,667	113,989	50,696	30,303	219,656
Stafford	45,198	48,185	118,698	120,455	43,930	72,465	239,153
Suffolk	32,253	43,481	101,091	109,340	55,744	34,064	210,431
Surrey	46,072	63,673	127,138	141,905	2,746	42,865	269,043
Suffex	25,272	30,755	78,797	80,514	38,925	19,608	159,311
Warwick	40,847	44,028	99,942	108,248	34,756	91,922	208,190
Westmorland	7,897	9,026	20,175	21,442	12,141	8,673	41,617
Wilts	29,462	30,527	87,380	97,727	53,517	39,422	185,107
Worcester	26,711	29,741	67,631	71,702	38,865	30,230	139,333
York (East Riding)	25,781	31,544	67,457	71,976	31,538	22,003	139,433
(North Riding)	31,512	34,542	74,904	80,602	44,061	26,207	155,506
(West Riding)	111,146	117,379	276,005	287,948	55,695	164,188	563,953
	1,467,870	1,778,420	3,987,935	4,243,499	1,524,227	1,789,531	8,331,434

NEW ENGLAND, late a province of the British empire in America, is bounded on the north by Canada, on the east by Nova Scotia and the Atlantic ocean, on the south by the Atlantic and Long Island sound, and on the west by New York. It lies in the form of a quarter of a circle. Its west line, beginning at the mouth of Byram river, which empties into Long Island sound at the south-west corner of Connecticut, latitude 41°, runs a little east of north, until it strikes the 45th degree of latitude, and then

curves to the eastward almost to the gulf of St Lawrence.

This country was discovered in the beginning of the last century, and called *North Virginia*; but no Europeans settled there till the year 1608. The first colony, which was weak and ill-directed, did not succeed; and, for some time, there were only a few adventurers who came over at times in the summer, built themselves temporary huts for the sake of trading with the savages, and, like them, disappeared again for the

New
England.

rest of the year. At last some Brownists, headed by Mr Robinson, whom Neal styles the Father of the Independents, who in 1610 had been driven from England by persecution, fled to Holland, and settled at Leyden; but in 1621 determined, with Mr Brewster assistant-preacher to Mr Robinson, to found a church for their sect in the new hemisphere. They therefore purchased, in 1521, the charter of the English North Virginia-company. Forty-one families, making in all 120 persons, landed in the beginning of a very hard winter, and found a country entirely covered with wood, which offered a very melancholy prospect to men already exhausted with the fatigues of their voyage. Near one half perished either by cold, the scurvy, or other distresses. The courage of the rest was beginning to fail; when it was revived by the arrival of 60 savage warriors, who came to them in the spring, headed by their chief. The old tenants assigned for ever to the new ones all the lands in the neighbourhood of the settlement they had formed, under the name of *New Plymouth*; and one of the savages who understood a little English staid to teach them how to cultivate the maize, and instruct them in the manner of fishing upon their coast.

This kindness enabled the colony to wait for the companions they expected from Europe with seeds, with domestic animals, and with every assistance they wanted. At first these succours arrived but slowly; but the persecution of the Puritans in England increased the number of proselytes to such a degree in America, that in 1630 they were obliged to form different settlements, of which Boston soon became the principal. These first settlers were not merely ecclesiastics, who had been deprived of their preferments on account of their opinions; nor those sectaries influenced by new opinions, that are so frequent among the common people. There were among them several persons of high rank, who, having embraced Puritanism, had taken the precaution to secure themselves an asylum in these distant regions. They had caused houses to be built, and lands to be cleared, with a view of retiring there, if there endeavours in the cause of civil and religious liberty should prove abortive.

The inhabitants of New England lived peaceably for a long time, without any regular form of policy. Their charter had indeed authorized them to establish any mode of government they might choose; but these enthusiasts were not agreed among themselves upon the plan of their republic, and government did not pay sufficient attention to them to urge them to secure their own tranquillity. At length they grew sensible of the necessity of a regular legislation; and this great work, which virtue and genius united have never attempted but with diffidence, was boldly undertaken by blind fanaticism. It bore the stamp of the rude prejudices on which it had been formed. There was in this new code a singular mixture of good and evil, of wisdom and folly. No man was allowed to have a share in the government except he were a member of the established church. Witchcraft, perjury, blasphemy, and adultery, were made capital offences; and children were also punished with death, either for cursing or striking their parents. Marriages, however, were to be solemnized by the magistrate. The price of corn was fixed at 2s. 11½d. per bushel. The savages who ne-

glected to cultivate their lands were to be deprived of them; and Europeans were forbidden under a heavy penalty to sell them any strong liquors or warlike stores. All those who were detected either in lying, drunkenness, or dancing, were ordered to be publicly whipped. But at the same time that amusements were forbidden equally with vices and crimes, one might be allowed to swear by paying a penalty of 11½d. and to break the sabbath for 2l. 19s. 9½d. Another indulgence allowed was, to atone, by a fine, for a neglect of prayer, or for uttering a rash oath. But it is still more extraordinary, that the worship of images was forbidden to the Puritans on pain of death; which was also inflicted on Roman Catholic priests, who should return to the colony after they had been banished; and on Quakers who should appear again after having been whipped, branded, and expelled. Such was the abhorrence for these sectaries, who had themselves an aversion for every kind of cruelty, that whoever either brought one of them into the country, or harboured him but for one hour, was liable to pay a considerable fine.

Those unfortunate members of the colony, who, less violent than their brethren, ventured to deny the coercive power of the magistrate in matters of religion, were persecuted with still greater rigour. This was considered as blasphemy by those very divines who had rather chosen to quit their country than to show any deference to Episcopal authority. This system was supported by the severities of the law, which attempted to put a stop to every difference in opinion, by inflicting capital punishment on all who dissented. Those who were either convicted, or even suspected, of entertaining sentiments of toleration, were exposed to such cruel oppressions, that they were forced to fly from their first asylum, and seek refuge in another. They found one on the same continent; and as New England had been first founded by persecution, its limits were extended by it.

This intemperate religious zeal extended itself to matters in themselves of the greatest indifference. A proof of this is found in the following public declaration, transcribed from the registers of the colony.

"It is a circumstance universally acknowledged, Law a-
"that the custom of wearing long hair, after the gainst
"manner of immoral persons and of the savage In- wearing
"dians, can have been introduced into England only long hair.
"in sacrilegious contempt of the express command of
"God, who declares that it is a shameful practice for
"any man who has the least care for his soul to wear
"long hair. As this abomination excites the indig-
"nation of all pious persons; we, the magistrates, in
"our zeal for the purity of the faith, do expressly
"and authentically declare, that we condemn the im-
"pious custom of letting the hair grow; a custom
"which we look upon to be very indecent and disho-
"onest, which horribly disguises men, and is offensive
"to modest and sober persons, in as much as it cor-
"rupts good manners. We therefore, being justly
"incensed against this scandalous custom, do desire,
"advise, and earnestly request all the elders of our
"continent, zealously to show their aversion for this
"odious practice, to exert all their power to put a
"stop to it, and especially to take care that the mem-
"bers of their churches be not infected with it; in
"order

New
England.3
Quakers
persecuted.Raynal's
History of
European
Settlements.2
First code
of laws.

New England. " order that those persons who, notwithstanding these rigorous prohibitions, and the means of correction that shall be used on this account, shall still persist in this custom, shall have both God and man at the same time against them."

This severity soon exerted itself against the Quakers. They were whipped, banished, and imprisoned. The behaviour of these new enthusiasts, who in the midst of tortures and ignominy praised God, and called for blessings upon men, inspired a reverence for their persons and opinions, and gained them a number of proselytes. This circumstance exasperated their persecutors, and hurried them on to the most atrocious acts of violence; and they caused five of them, who had returned clandestinely from banishment, to be hanged. This spirit of persecution was, however, at last suppressed by the interposition of the mother-country, from whence it had been brought. Charles II. moved with the sufferings of the Quakers, put a stop to them by a proclamation in 1661; but he was never able totally to extinguish the spirit of persecution that prevailed in America.

The colony had placed at their head Henry Vane, the son of that Sir Henry Vane who had such a remarkable share in the disturbances of his country. This obstinate and enthusiastic young man had contrived to revive the questions of grace and free will. The disputes upon these points ran very high; and would probably have plunged the colony into a civil war, if several of the savage nations united had not happened at that very time to fall upon the plantations of the disputants, and to massacre great numbers of them. The colonists, heated with their theological contests, paid at first very little attention to this considerable loss. But the danger at length became so urgent and so general, that all took up arms. As soon as the enemy was repulsed, the colony resumed its former dissensions; and the frenzy which they excited broke out in 1692 in a war, marked with as many atrocious instances of violence as any ever recorded in history.

5 Extraordinary persecution of witches. There lived in a town of New England, called Salem, two young women who were subject to convulsions, accompanied with extraordinary symptoms. Their father, minister of the church, thought that they were bewitched; and having in consequence cast his suspicions upon an Indian girl who lived in his house, he compelled her by harsh treatment to confess that she was a witch. Other women, upon hearing this, immediately believed, that the convulsions, which proceeded only from the nature of their sex, were owing to the same cause. Three citizens, casually named, were immediately thrown into prison, accused of witchcraft, hanged, and their bodies left exposed to wild beasts and birds of prey. A few days after, 16 other persons, together with a counsellor, who, because he refused to plead against them, was supposed to share in their guilt, suffered in the same manner. From this instant, the imagination of the multitude was inflamed with these horrid and gloomy scenes. Children of ten years of age were put to death, young girls were stripped naked, and the marks of witchcraft searched for upon their bodies with the most indecent curiosity; and those spots of the scurvy which age impresses upon the bodies of old men were taken for evident signs of the

infernal power. In default of these, torments were employed to extort confessions dictated by the executioners themselves. If the magistrates, tired out with executions, refused to punish, they were themselves accused of the crimes they tolerated; the very ministers of religion raised false witnesses against them, who made them forfeit with their lives the tardy remorse excited in them by humanity. Dreams, apparitions, terror, and consternation of every kind, increased these prodigies of folly and horror. The prisons were filled, the gibbets left standing, and all the citizens involved in gloomy apprehensions. The most prudent quitted the country stained with the blood of its inhabitants; and nothing less than the total and immediate subversion of the colony was expected, when, on a sudden, all eyes were opened at once, and the excess of the evil awakened the minds which it had first stupified. Bitter and painful remorse was the immediate consequence; the mercy of God was implored by a general fast, and public prayers were offered up to ask forgiveness for the presumption of having supposed that Heaven could have been pleased with sacrifices with which it could only have been offended.

Posterity will probably never know exactly what was the cause or remedy of this dreadful disorder. It had, perhaps, its first origin in the melancholy which those persecuted enthusiasts had brought with them from their own country, which had increased with the scurvy they had contracted at sea, and had gathered fresh strength from the inconveniences and hardships inseparable from a change of climate and manner of living. The contagion, however, ceased like all other epidemical distempers, exhausted by its very communication. A perfect calm succeeded this agitation; and the Puritans of New England have never since been seized with so gloomy a fit of enthusiasm.

But though the colony has renounced the persecuting spirit which hath stained all religious sects with blood, it has preserved some remains, if not of intolerance, at least of severity, which remind us of those melancholy days in which it took its rise. Some of its laws are still too severe.

New England had, however, some remedy against bad laws, in the constitution of its mother-country, where the people who have the legislative power in their own hands are at liberty to correct abuses; and it has others derived from its situation, which open a vast field to industry and population.

6 Manner of settlement in this colony. The clearing of the lands in this colony is not directed by chance as in the other provinces. This matter from the first was subjected to laws which are still religiously observed. No citizen whatever has the liberty of settling even upon unoccupied land. The government, desirous of preserving all its members from the inroads of the savages, and of placing them in a condition to share in the protection of a well-regulated society, hath ordered that whole villages should be formed at once. As soon as 60 families offer to build a church, maintain a clergyman, and pay a school master, the general assembly allot them a situation, and permit them to have two representatives in the legislative body of the colony. The district assigned them always borders upon the lands already cleared, and generally contains 60,000 square acres. These new people chose the situation most convenient for their habitation.

New
England.

tion, which is usually of a square figure. The church is placed in the centre; the colonists divide the land among themselves, and each incloses his property with a hedge. Some woods are reserved for a common; and thus New England is constantly enlarging its territory, though it still continues to make one complete and well constituted province.

7
Division,
&c.

The country was divided into four states, which at first had no connexion with one another. The necessity of maintaining an armed force against the savages, obliged them to form a confederacy in 1643, when they took the name of the *United Colonies*. In consequence of this league, two deputies from each establishment used to meet in a stated place to deliberate upon the common affairs of New England, according to the instructions they had received from the assembly by which they were sent. This association laid no constraint upon the right of every individual to act entirely as he pleased, without either the permission or approbation of the mother-country. All the submission required of these provinces was merely to acknowledge the kings of England for their sovereigns. Charles II. wished to make them more dependent. The province of Massachusetts's bay, which, though the smallest, was the richest and the most populous of the four, being guilty of some misdemeanour against government, the king seized that opportunity of taking away its charter in 1684: and it remained without one till the revolution; when it received another, which, however, did not answer its claims or expectations. The crown reserved to itself the right of nominating the governor, and appointing to all military employments, and to all principal posts in the civil and juridical departments: it allowed the people of the colony their legislative power, and gave the governor a negative voice and the command of the troops, which secured him a sufficient influence to enable him to maintain the prerogative of the mother-country in all its force. The provinces of Connecticut and Rhode-Island, by timely submission, prevented the punishment which that of Massachusetts had incurred, and retained their original charter. That of New-Hampshire had been always regulated by the same mode of administration as the province of Massachusetts bay. The same governor presided over the whole colony, but with regulations adapted to the constitution of each province. To the above states, another has been added since the revolution, viz. VERMONT. These states are subdivided into counties, and the counties into townships.

8
Face of the
country,
mountains,
&c.

New England is a high, hilly, and in some parts a mountainous country, formed by nature to be inhabited by a hardy race of free, independent republicans.—The mountains are comparatively small, running nearly north and south in ridges parallel to each other. Between these ridges flow the great rivers in majestic meanders, receiving the innumerable rivulets and larger streams which proceed from the mountains on each side. To a spectator on the top of a neighbouring mountain, the vales between the ridges, while in a state of nature, exhibit a romantic appearance. They seem an ocean of woods, swelled and depressed in its surface like that of the great ocean itself. A richer though less romantic view is presented, when the valleys, by industrious husbandmen, have been cleared of their natural growth; and the fruit of their labour ap-

New
England.

pears in loaded orchards, extensive meadows, covered with large herds of sheep and neat cattle, and rich fields of flax, corn, and the various kinds of grain. These valleys, which have received the expressive name of *interval lands*, are of various breadths, from two to 20 miles; and by the annual inundations of the rivers which flow through them, there is frequently an accumulation of rich, fat soil, left upon their surface when the waters retire.

There are four principal ranges of mountains, passing nearly from north-east to south-west through New England. These consist of a multitude of parallel ridges, each having many spurs, deviating from the course of the general range; which spurs are again broken into irregular hilly land. The main ridges terminate, sometimes in high bluff heads, near the sea-coast, and sometimes by a gradual descent in the interior part of the country. One of the main ranges runs between Connecticut and Hudson's rivers. This range branches and bounds the vales through which flows the Housatonic river. The most eastern ridge of this range terminates in a bluff head at Meriden; a second ends in like manner at Willingford, and a third at New Haven. In Lyme, on the east side of Connecticut river, another range of mountains commences, forming the eastern boundary of Connecticut vale. This range tends northerly, at the distance, generally, of about 10 or 12 miles east from the river, and passes through Massachusetts, where the range takes the name of *Chickabee Mountain*; thence crossing into New Hampshire, at the distance of about 20 miles from the Massachusetts line, it runs up into a very high peak, called *Monadnick*, which terminates this ridge of the range. A western ridge continues, and in about latitude $43^{\circ} 20'$ runs up into Sunapee mountains. About 50 miles further, in the same ridge, is Mooscoog mountain. A third range begins near Stonington in Connecticut. It takes its course north-easterly, and is sometimes broken and discontinued; it then rises again, and ranges in the same direction into New Hampshire, where, in latitude $43^{\circ} 25'$, it runs up into a high peak called *Cowsarvaskog*. The fourth range has a humble beginning about Hopkinton in Massachusetts. The eastern ridge of this range runs north by Watertown and Concord, and crosses Merrimack river at Pantucket Falls. In New Hampshire, it rises into several high peaks, of which the White mountains are the principal. From these White mountains a range continues north-east, crossing the east boundary of New Hampshire, in latitude $44^{\circ} 30'$, and forms the height of land between Kennebec and Chaudiere rivers. These ranges of mountains are full of lakes, ponds, and springs of water, that give rise to numberless streams of various sizes, which, interlocking each other in every direction, and falling over the rocks in romantic cascades, flow meandering into the rivers below. No country on the globe is better watered than New England.

On the sea-coast the land is low, and in many parts level and sandy. In the valleys, between the forementioned ranges of mountains, the land is generally broken, and in many places rocky, but of a strong rich soil, capable of being cultivated to good advantage, which also is the case with many spots even on the tops of the mountains.

The

New
England.

The principal river in New England is Connecticut. See CONNECTICUT.

9
Soil, pro-
ductions,
&c.

The soil, as may be collected from what has been said, must be very various. Each tract of different soil is distinguished by its peculiar vegetation, and is pronounced good, middling, or bad, from the species of trees which it produces; and from one species generally predominating in each soil, has originated the descriptive names of oak land, birch, beech, and chestnut lands, pine, barren, maple, ash, and cedar swamps, as each species happens to predominate. Intermingled with those predominating species are walnut, firs, elm, hemlock, magnolia, moose-wood, sassafras, &c. &c. The best lands produce walnut and chestnut; the next, beech and oak; lands of the third quality produce fir and pitch-pine; the next, whortleberry and barberry bushes; and the poorest produce nothing but marshy imperfect shrubs. Among the flowering trees and shrubs in the forests are the red-flowering maple, the sassafras, the locust-tree, the tulip-tree, honeysuckle, wild rose, dogwood, elm, leather-tree, laurel, hawthorn, &c. which in the spring of the year give the woods a most beautiful appearance, and fill them with a delicious fragrance. Among the fruits which grow wild, are the several kinds of grapes; which are small, sour, and thick skinned. The vines on which they grow are very luxuriant, often overspreading the highest trees in the forests; and without doubt, may be greatly meliorated by proper cultivation. Besides these, are the wild cherries, white and red mulberries, cranberries, walnuts, hazel nuts, chestnuts, butter nuts, beech nuts, wild plums and pears, whortle-berries, bilberries, gooseberries, strawberries, &c.

The soil in the interior country is calculated for the culture of Indian corn, rye, oats, barley, flax, and hemp (for which the soil and climate are peculiarly proper), buck-wheat, beans, pease, &c. In many of the inland parts wheat is raised in large quantities; but on the sea-coast it has never been cultivated with success, being subject to blasts. The fruits which the country yields from culture, are apples in the greatest plenty; of these cyder is made, which constitutes the principal drink of the inhabitants; also, pears of various sorts, quinces, peaches (from which is made peach brandy,) plums, cherries, apricots, &c. The culinary plants are such as have already been enumerated. New England is a fine grazing country; the valleys between the hills are generally intersected with brooks of water, the banks of which are lined with a tract of rich meadow or interval land. The high and rocky ground is, in many parts, covered with honeysuckle, and generally affords the finest of pasture. It will not be a matter of wonder, therefore, that New England boasts of raising some of the finest cattle in the world; nor will she be envied, when the labour of raising them is taken into view. Two months of the hottest season in the year the farmers are employed in procuring food for their cattle; and the cold winter is spent in dealing it out to them. The pleasure and profit of doing this, is however a satisfying compensation to the honest and industrious farmer.

10
Population,
manners,
customs,
and diver-
sions.

New England is the most populous part of the United States. It contains at least 823,000 souls. One fifth of these are fencible men. New England then, should any great and sudden emergency require it,

could furnish an army of 164,600 men. The great body of these are land-holders and cultivators of the soil. The former attaches them to their country; the latter, by making them strong and healthy, enables them to defend it. The boys are early taught the use of arms, and make the best of soldiers. Few countries on earth, of equal extent and population, can furnish a more formidable army than this part of the union.

New
England.

New England may, with propriety, be called a nursery of men, whence are annually transplanted, into other parts of the United States, thousands of its natives. The state of Vermont, which is but of yesterday, and contains about 100,000 souls, has received more inhabitants from Connecticut than from any other state; and yet between the years 1774 and 1782, notwithstanding her numerous emigrations to Vermont, Susquehannah, and other places, and the depopulation occasioned by a seven years bloody war, it is found, from an actual census of the inhabitants in the years before-mentioned, that they have increased from 197,856, their number in 1774, to 290,150, their number in 1782. Vast numbers of the New Englanders, since the war, have emigrated into the northern parts of New York, into Kentucky and the Western Territory, and into Georgia; and some are scattered into every state, and every town of note in the union.

The New Englanders are generally tall, stout, and well built. They glory, and perhaps with justice, in possessing that spirit of freedom which induced their ancestors to leave their native country, and to brave the dangers of the ocean and the hardships of settling in a wilderness. Their education, laws, and situation, serve to inspire them with high notions of liberty. Their jealousy is awakened at the first motion toward an invasion of their rights. They are indeed often jealous to excess; a circumstance which is a fruitful source of imaginary grievances, and of innumerable groundless suspicions and unjust complaints against government. A law, respecting the descent of estates which are generally held in fee simple, which for substance is the same in all the New England states, is the chief foundation and protection of this liberty. By this law, the possessions of the father are to be equally divided among all the children, excepting the eldest son, who has a double portion. In this way is preserved that happy mediocrity among the people, which, by inducing economy and industry, removes from them temptations to luxury, and forms them to habits of sobriety and temperance. At the same time, their industry and frugality exempt them from want, and from the necessity of submitting to any encroachment on their liberties.

In New England, learning is more generally diffused among all ranks of people than in almost any other part of the globe; arising from the excellent establishment of schools in every township. Another source of information to the people is the newspapers, of which not less than 30,000 are printed every week in New England, and circulated in almost every town and village in the country. A person of mature age, who cannot both read and write, is rarely to be found. By means of this general establishment of schools, the extensive circulation of newspapers, and the consequent spread of learning, every township throughout the country is furnished with men capable of conducting

New
England.

ting the affairs of their town with judgment and discretion. These men are the channels of political information to the lower class of people; if such a class may be said to exist in New England, where every man thinks himself at least as good as his neighbour, and believes that all mankind are, or ought to be, equal. The people from their childhood form habits of canvassing public affairs, and commence politicians. This naturally leads them to be very inquisitive. This desire after knowledge, in a greater or lesser degree, prevails throughout all classes of people in New England; and from their various modes of expressing it, some of which are blunt and familiar, bordering on impertinence, strangers have been induced to mention impertinent inquisitiveness as a distinguishing characteristic of New England people.—Each man also has his independent system of politics; and each assumes a dictatorial office. Hence originates that restless, litigious, complaining spirit, which forms a dark shade in the character of New Englandmen.

Before the American war, which introduced into New England a flood of corruptions, with many improvements, the Sabbath was observed with great strictness; no unnecessary travelling, no secular business, no visiting, no diversions, were permitted on that sacred day. They considered it as consecrated to divine worship, and were generally punctual and serious in their attendance upon it. Their laws were strict in guarding the Sabbath against every innovation. The supposed severity with which these laws were composed and executed, together with some other traits in their religious character, have acquired, for the New Englanders, the name of a superstitious bigotted people. But superstition and bigotry are so indefinite in their significations, and so variously applied by persons of different principles and educations, that it is not easy to determine how far they deserved that character. Leaving every person to enjoy his own opinion in regard to this matter, we will only observe, that, since the war, a catholic tolerant spirit, occasioned by a more enlarged intercourse with mankind, has greatly increased, and is becoming universal; and if they do not break the proper bound, and liberalize away all true religion, of which there is much danger, they will counteract that strong propensity in human nature, which leads men to vibrate from one extreme to its opposite.

There is one distinguishing characteristic in the religious character of this people, which we must not omit to mention; and that is, the custom of annually celebrating fasts and thanksgivings. In the spring, the several governors issue their proclamations, appointing a day to be religiously observed in fasting, humiliation, and prayer, throughout their respective states, in which the predominating vices, that particularly call for humiliation, are enumerated. In autumn, after harvest, that gladsome era in the husbandman's life, the governors again issue their proclamations appointing a day of public thanksgiving, enumerating the public blessings received in the course of the foregoing year. This pious custom originated with their venerable ancestors, the first settlers of New England; and has been handed down as sacred through the successive generations of their posterity. A custom so rational, and so happily calculated to cherish in the minds of the people a sense of their dependence on the great Bene-

factor of the world for all their blessings, it is hoped will ever be sacredly preserved.

New
England.

The people of New England generally obtain their estates by hard and persevering labour: They of consequence know their value, and spend with frugality. Yet in no country do the indigent and unfortunate fare better. Their laws oblige every town to provide a competent maintenance for their poor; and the necessitous stranger is protected and relieved from their humane institutions. It may in truth be said, that in no part of the world are the people happier, better furnished with the necessaries and conveniences of life, or more independent than the farmers in New England. As the great body of the people are hardy independent freeholders, their manners are, as they ought to be, congenial to their employment, plain, simple, and unpolished. Strangers are received and entertained among them with a great deal of artless sincerity and friendly informal hospitality. Their children, those imitative creatures, to whose education particular attention is paid, early imbibe the manners and habits of those around them; and the stranger, with pleasure, notices the honest and decent respect that is paid him by the children as he passes through the country.

As the people, by representation, make their own laws and appoint their own officers, they cannot be oppressed; and living under governments which have few lucrative places, they have few motives to bribery, corrupt canvassings, or intrigue. Real abilities and a moral character unblemished are the qualifications requisite in the view of most people for offices of public trust. The expression of a wish to be promoted is the direct way to be disappointed.

The inhabitants of New England are generally fond of the arts, and have cultivated them with great success. Their colleges have flourished beyond any others in the United States. The illustrious characters they have produced, who have distinguished themselves in politics, law, divinity, the mathematics and philosophy, natural and civil history, and in the fine arts, particularly in poetry, evince the truth of these observations.

Many of the women in New England are handsome. They generally have fair, fresh, and healthful countenances, mingled with much female softness and delicacy. Those who have had the advantages of a good education (and they are considerably numerous) are genteel, easy, and agreeable in their manners, and are sprightly and sensible in conversation. They are early taught to manage domestic concerns with neatness and economy. Ladies of the first rank and fortune make it a part of their daily business to superintend the affairs of the family. Employment at the needle, in cookery, and at the spinning-wheel, with them is honourable. Idleness, even in those of independent fortunes, is universally disreputable. The women in the country manufacture the greatest part of the clothing of their families. Their linen and woollen cloths are strong and decent. Their butter and cheese is not inferior to any in the world.

Dancing is the principal and favourite amusement in New England; and of this the young people of both sexes are extremely fond. Gaming is practised by none but those who cannot or rather will not find a reputable employment. The gamester, the horse-jockey, and the knave, are equally despised, and their company is avoided

New
England,
English.

avoided by all who would sustain fair and irreproachable characters. The odious and inhuman practices of duelling, gouging, cock-fighting, and horse-racing, are scarcely known here.—The athletic and healthy diversions of cricket, football, quoits, wrestling, jumping, foot-races, &c. are universally practised in the country, and some of them in the most populous places, and by people of almost all ranks. Squirrel-hunting is a noted diversion in country places, where this kind of game is plenty. Some divert themselves with fox-hunting, and others with the more profitable sports of fishing and duck-hunting; and in the frontier settlements, where deer and fur game abound, the inhabitants make a lucrative sport of hunting them. In the winter season, while the ground is covered with snow, which is commonly two or three months, sleighing is the general diversion. A great part of the families throughout the country are furnished with horses and sleighs.

11
Trade.

New England has no one staple commodity. The ocean and the forests afford the two principal articles of export. Cod-fish, mackarel, shad, salmon, and other fish, whale-oil and whale-bone, masts, boards, scantling, staves, hoops, and shingles, have been and are still exported in large quantities. The annual amount of cod and other fish for foreign exportation, including the profits arising from the whale-fishery, is estimated at upwards of half a million.—Besides the articles enumerated, they export from the various parts of New England ships built for sale, horses, mules, live stock, pickled beef and pork, pot-ash, pearl-ash, flax-seed, butter and cheese, rum, &c. The balance of trade, as far as imperfect calculations will enable us to judge, has generally been against New England; not from any unavoidable necessity, but from her extravagant importations. From a view of the annual imports into New England, it appears that the greatest part of them consists of the luxuries, or at best the dispensable conveniences of life; the country affords the necessaries in great abundance.

ENGLISH, or the *English Tongue*, the language spoken by the people of England, and, with some variation, by those of Scotland, as well as part of Ireland, and the rest of the British dominions.

The ancient language of Britain is generally allowed to have been the same with the Gallic, or French; this island, in all probability, having been first peopled from Gallia, as both Cæsar and Tacitus affirm, and prove by many strong and conclusive arguments, as by their religion, manners, customs, and the nearness of their situation. But now we have very small remains of the ancient British tongue, except in Wales, Cornwall, the islands and highlands of Scotland, part of Ireland, and some provinces of France; which will not appear strange, when what follows is considered.

Julius Cæsar, some time before the birth of our Saviour, made a descent upon Britain, though he may be said rather to have discovered than conquered it; but about the year of Christ 45, in the time of Claudius, Aulus Plautius was sent over with some Roman forces, by whom two kings of the Britons, Togodumnus and Caractacus, were both overcome in battle: whereupon a Roman colony was planted at Malden in Essex, and the southern parts of the island were redu-

VOL. VIII. Part I.

ced to the form of a Roman province: after that, the island was conquered as far north as the friths of Dunbarton and Edinburgh, by Agricola, in the time of Domitian; whereupon a great number of the Britons, in the conquered part of the island, retired to the west part called *Wales*, carrying their language with them.

English.

The greatest part of Britain being thus become a Roman province, the Roman legions, who resided in Britain for above 200 years, undoubtedly disseminated the Latin tongue; and the people being afterwards governed by laws written in Latin must necessarily make a mixture of languages. This seems to have been the first mutation the language of Britain suffered.

Thus the British tongue continued, for some time, mixed with the provincial Latin, till the Roman legions being called home, the Scots and Picts took the opportunity to attack and harass England: upon which King Vortigern, about the year 440, called the Saxons to his assistance; who came over with several of their neighbours, and having repulsed the Scots and Picts, were rewarded for their services with the isle of Thanet, and the whole county of Kent; but growing too powerful, and not being contented with their allotment, dispossessed the inhabitants of all the country on this side of the Severn*: thus the British tongue was in a great measure destroyed, and the Saxon introduced in its stead.

* See *Eng-land*, N^o 13
—42.

What the Saxon tongue was long before the conquest, about the year 700, we may observe in the most ancient manuscript of that language, which is a gloss on the Evangelists, by Bishop Edfrid, in which the three first articles of the Lord's prayer run thus:

“Uren fader thic arth in heofnas, sic gehalgud thin noma, so cymeth thin ric. Sic thin willa sue is heofnas, and in eorþo,” &c.

In the beginning of the ninth century the Danes invaded England; and getting a footing in the northern and eastern parts of the country, their power gradually increased, and they became sole masters of it in about 200 years. By this means the ancient British obtained a tincture of the Danish language; but their government being of no long continuance, did not make so great an alteration in the Anglo-Saxon as the next revolution, when the whole land, A. D. 1067, was subdued by William the Conqueror, duke of Normandy in France: for the Normans, as a monument of their conquest, endeavoured to make their language as generally received as their commands, and thereby rendered the British language an entire medley.

About the year 900, the Lord's prayer, in the ancient Anglo-Saxon, ran thus:

“Thue ur fader the eart on heofenum, si thin nama gehalgod; cume thin rice sitlin will a on eorþan swa, fwo on heofenum,” &c.

About the year 1160, under Henry II. it was rendered thus by Pope Adrian, an Englishman, in rhyme:

“Ure fader in heaven rich,
“Thy name be halyed ever lich,
“Thou bring us thy michel blesse:
“Als hit in heaven y doe,
“Evar in yearth been it also,” &c.

Dr Hicks gives us an extraordinary specimen of the
R English,

English. English, as spoken in the year 1385, upon the very subject of the English tongue.

“As it is knowe how meny maner peple beeth in this lond; ther beeth also so many dyvers longages and tonges. Notheles Walschemen and Scots that beeth nought medled with other nation, holdeth wel nyh hir firste longage and speche; but yif the Scottes, that were sometime confederate and woned with the Pictes, drawe somewhat after hir speche; but the Flemynges, that woneth on the west side of Wales, haveth lost her strange speche, and spekeheth Saxonliche now. Also Englishemen, they had from the bygynnyng thre maner speche; northerne, southerne, and middel speche in the middel of the lond, as they come of thre maner of peple of Germania: notheles by comyxtion and mellyng first with Danes, and afterwards with Normans, in meny the contrary longage is apayred (*corrupted.*)

“This apayryng of the burth of the tunge is by cause of tweie things; oon is for children in scole agenst the usuage and maner of all other nations, beeth compelled for to leve hir own longage, and for to construe hir lessons and here things in Frensch, and so they haveth sethe Normans come first into Engeland. Also gentlemen children beeth taught to speke Frensch from the tyme that they beeth roked in here cradel, and kunneth speke and play with a childe's broche; and uplondische men will lykne hymself to gentilmen, and fondeth with great besynesse for to speak Frensch to be told of.—Hit seemeth a great wonder how Englishemen and hir own longage and tonge is so dyverle of sown in this oon iland; and the longage of Normandie is comlyng of another lond, and hath oon maner foun amonge alle men that speketh hit arigt in Engeland. Also of the foresaid Saxon tonge that is deled (*divided*) a three, and is abide scarceliche with fewe uplondische men is greet wonder. For men of the est, with men of the west, is, as it were, undir the same partie of hevne accordeth more in sownyng of speche, than men of the north with men of the south. Therefore it is that Mercii, that beeth men of myddel Engeland, as it were, parteners of the endes, understondeth better the side longes northerne and southerne, than northerne and southerne understondeth either other.—All the longage of the Northumbers and spechialliche at York, is so scharp, slitting, and frotynge, and unschape, that we southerne men may that longage unnethe understonde,” &c.

In the year 1537, the Lord's prayer was printed as follows: “Ooure father which arte in heven, hallowe be thy name: let thy kingdome come, thy will be fulfilled as well in erth as it is in heven; geve us this daye in dayly bred,” &c. Where it may be observed, that the diction is brought almost to the present standard, the chief variations being only in the orthography. By these instances, and many others that might be given, it appears, that the English Saxon language, of which the Normans despoiled us in a great measure, had its beauties, was significant and emphatical, and preferable to what they imposed on us. “Great, verily (says Camden), was the glory of our tongue before the Norman conquest, in this, that the old English could expresse, most aptly, all the conceptions of the mind in their own tongue, without borrowing from any.” Of this he gives several examples.

Having thus shown how the ancient British language was in a manner extirpated by the Romans, Danes, and Saxons, and succeeded by the Saxon, and after that the Saxon blended with the Norman French, we shall now mention two other causes of change in the language. The first of these is owing to the Britons having been a long time a trading nation, whereby offices, dignities, names of wares, and terms of traffic, are introduced, which we take with the wares from the persons of whom we have them, and form them anew, according to the genius of our own tongue; and besides this change in the language, arising from commerce, Britain's having been a considerable time subject to the see of Rome, in ecclesiastical affairs, must unavoidably have introduced some Italian words among us. Secondly, As to the particular properties of a language, our tongue has undergone no small mutation, or rather has received no small improvement upon that account: for, as to the Greek and Latin, the learned have, together with the arts and sciences now rendered familiar among us, introduced abundance; nay, almost all the terms of art in the mathematics, philosophy, physic, and anatomy; and we have entertained many more from the Latin, French, &c. for the sake of neatness and elegancy; so that, at this day, our language, which, about 1800 years ago, was the ancient British, or Welch, &c. is now a mixture of Saxon, Teutonic, Dutch, Danish, Norman, and modern French, embellished with the Greek and Latin. Yet this, in the opinion of some, is so far from being a disadvantage to the English tongue as now spoken (for all languages have undergone changes, and do continually participate with each other), that it has so enriched it, as now to render it the most copious, significant, fluent, courteous, and masculine language in Europe, if not in the world.

ENGRAFTING, in *Gardening*. See GRAFTING, GARDENING *Index*.

ENGRAILED, or INGRAILED, in *Heraldry*, a term derived from the French *greffy*, “hail;” and signifying a thing the hail has fallen upon and broke off the edges, leaving them ragged, or with half rounds, or semicircles, struck out of their edges.

ENGRAVING, the art of cutting metals and precious stones, and representing thereon figures, letters, or whatever device or design the artist fancies.

Engraving, properly a branch of sculpture, is divided into several other branches, according to the matter whereon it is employed, and the manner of performing it. For the rudest branch, that of

ENGRAVING on Wood, see WOOD, *Engraving on*.

ENGRAVING on Copper, the making, correspondently to some delineated figure or design, such concave lines on a smooth surface of copper, either by cutting or corrosion, as render it capable, when charged properly with any coloured fluid, of imparting by compression an exact representation of the figure or design to paper or parchment.

Whether we consider the art of engraving, with regard to the utility and pleasure it affords, or the difficulty that attends its execution, we cannot but confess, that on every account it deserves a distinguished rank among the polite arts †. It is by means of this art † See *Pa.* that the cabinets of the curious are adorned with the *lite* ARTS, portraits of the greatest men of all ages and all nations; 13-

*English.**English*
||
Engraving.

Engraving. tions; that their memories, their most remarkable and most glorious actions, are transmitted to the latest posterity. It is by this art also, that the paintings of the greatest masters are multiplied to a boundless number; and that the lovers of the polite arts, diffused over the face of the whole earth, are enabled to enjoy those beauties from which their distant situations seemed to have for ever debarred them; and persons of moderate fortune are hereby enabled to become possessed of all the spirit, and all the poetry, that are contained in those miracles of art, which seemed to have been reserved for the temples of Italy, or the cabinets of princes. When we reflect, moreover, that the engraver, beside the beauties of poetic composition, and the artful ordinance of design, is to express, merely by the means of light and shade, all the various tints of colours and clear obscure; to give a relief to each figure, and a truth to each object; that he is now to paint a sky serene and bright, and then loaded with dark clouds; now the pure tranquil stream, and then the foaming, raging sea; that here he is to express the character of the man, strongly marked in his countenance, and there the minutest ornament of his dress; in a word, that he is to represent all even the most difficult objects in nature; we cannot sufficiently admire the vast improvements in this art, and that degree of perfection to which it is at this day arrived. See the article PRINTS.

Engraving is an art, for the greatest part, of modern invention; having its rise no earlier than the middle of the 15th century. The ancients, it is true, practised engraving on precious stones and crystals with very good success; and there are still many of their works remaining equal to any production of the later ages. But the art of engraving on plates and blocks of wood, to afford prints or impressions, was not known till after the invention of painting in oil.

The different modes of engraving are the following:

In strokes cut through a thin wax, laid upon the copper, with a point, and these strokes bitten or corroded into the copper with aquafortis. This is called *etching*.

In strokes with the graver alone, unassisted by aquafortis. In this instance, the design is traced with a sharp tool, called a *dry point*, upon the plate; and the strokes are cut or ploughed upon the copper with an instrument distinguished by the name of a *graver*.

In strokes first etched and afterwards finished with the graver: by this expedient the two former methods are united.

In dots without strokes, which are executed with the point upon the wax or ground, bitten in with the aquafortis, and afterwards harmonized with the graver, by the means of which instrument small dots are made; or with the graver alone, as in the flesh and finer parts, unassisted with the point.

In dots first etched and afterwards harmonized with the dry point, performed by a little hammer, called *opus mallei*, or the *work of the hammer*, as practised by Lutma and others.

In mezzotinto, which is performed by a dark barb or ground being raised uniformly upon the plate with a toothed tool. The design being traced upon the plate, the light parts are scraped off by instruments for that purpose, in proportion as the effect requires.

In aquatinta, a newly invented method of engraving.

The outline is first etched, and afterwards a sort of Engraving-wash is laid by the aquafortis upon the plate, resembling drawings in Indian ink, bistre, &c.

On wood, performed with a single block, on which the design is traced with a pen, and those parts which should be white carefully hollowed out; and this block is afterwards printed by the letter-press printers, in the same manner as they print a book.

On wood, performed with two, three, or more blocks; the first having the outlines cut upon it; the second is reserved for the darker shadows; and the third for the shadows which terminate upon the lights; and these are substituted in their turn, each print receiving an impression from every block. This mode of engraving is called *chiaro-scuro*, and was designed to represent the drawings of the old masters.

On wood and on copper: in these the outline is engraved in a bold dark style upon the copper; and two or more blocks of wood are substituted to produce the darker and lighter shadows, as before.

Of all those modes of engraving, the most ancient is that on *wood*; or, to speak more properly, the first impressions on paper were taken from carved wooden blocks. For this invention it appears that we are indebted to the brief-malers or makers of playing-cards, who practised the art in Germany about the beginning of the 15th century. From the same source may perhaps be traced the first idea of moveable types, which appeared not many years after: for these brief-malers did not entirely confine themselves to the printing and painting of cards, but produced also subjects of a more devout nature; many of which, taken from holy writ, are still preserved in different libraries in Germany, with the explanatory text facing the figures; the whole engraved in wood. In this manner they even formed a species of books; such as, *Historia sancti Johannis, ejusque Visiones Apocalyptice; Historia Veteris et Novi Testamenti*, known by the name of the *Poor Man's Bible*. These short mementos were printed only on one side; and two of them being pasted together, had the appearance of a single leaf. The earliest date on any of these wooden cuts is 1423. The subject is *St Christopher carrying the Infant Jesus over the Sea*, preserved in a convent at Buxheim near Menningen. It is of a folio size, illuminated in the same manner as the playing cards; and at the bottom is this inscription, *Christoferi faciem die quacunque tueris. Illa nempe die morte mala non morieris. Millefimo CCCC^o XX^o tertio.*

Upon the invention of moveable types, that branch ^{Strutt's} of the brief-malers business, so far as it regarded the ^{Hist of En-} making of books, was gradually discontinued; but the ^{graving.} art itself of engraving on wood continued in an improving state; and towards the end of the 15th and beginning of the 16th century, it became customary for almost every one of the German engravers on copper to engrave on wood also. The works of Albert Durer in this style of engraving are justly held in the highest esteem. Italy, France, and Holland, have produced many capital artists of this kind; but for boldness and spirit, we must see the prints of Christopher Jegher, who worked under the direction of Rubens, and was without doubt assisted by that great master.

The invention of that species of engraving distinguished

Engraving-guished by the appellation of *chiaro-scuro*, seems also to be justly claimed by the Germans, and first practised by Mair; one of whose prints of this kind is dated 1499. Many excellent works in *chiaro-scuro* have been produced in France; and in Italy it was honoured with the performances of Titian and Parmegiano; but the attempts of Jackson, Kirkall, and others in England, have not been equally successful. A set of excellent prints in this way have lately been published by J. Skippe, Esq. a connoisseur and dilettante.

Strutt's
Hist. of En-
graving.

In Germany, about the year 1450, prints from engraved copper first made their appearance. The earliest date of a copperplate print is indeed only 1461; but however faulty this print may be with respect to the drawing, or defective in point of taste, the mechanical part of the execution of it has by no means the appearance of being one of the first productions of the graver. We have also several other engravings, evidently the work of the same master; in which the impressions are so neatly taken from the plates, and the engravings so clearly printed in every part, that according to all appearance they could not be executed in a much better manner in the present day, with all the conveniences which the copperplate printers now possess, and the additional knowledge they must necessarily have acquired in the course of more than three centuries. Hence we may fairly conclude, that if they were not the first specimens of the engraver's workmanship, they were much less the first efforts of the copperplate printer's ability. It is likewise to be observed, that Martin Schoen, who is said, with great appearance of truth, to have worked from 1460 to 1486, was apparently the scholar of Stoltzhirs; for he followed his style of engraving, and copied from him a set of prints, representing the passion of our Saviour. Now, allowing Stoltzhirs to have preceded his disciple only ten years, this carries the era of the art back to 1450, as was said above. There is no ground to suppose that it was known to the Italians till at least ten years afterwards. The earliest prints that are known to be theirs are a set of the seven planets, and an almanack by way of frontispiece; on which are directions for finding Easter from the year 1465 to 1517 inclusive: and we may be well assured, that the engravings were not antedated, for the almanack of course became less and less valuable every year. In all probability, therefore, these prints must have been executed in the year 1464, which is only four years later than the Italians themselves lay any claim to. The three earliest Italian engravers are, Finiguerra, Boticelli, and Baldini. If we are to refer these prints to any of the three, we shall naturally conclude them to be the work of Finiguerra or Baldini; for they are not equal either in drawing or composition to those ascribed to Boticelli, which we know at least were designed by him; and as Baldini is expressly said to have worked from the designs of Boticelli, it will appear most probable that they belong to Finiguerra.

With respect to the invention of *etching*, it seems to be not well known to whom it is to be ascribed. One of the most early specimens is that print by Albert Durer, known by the name of the *Canon*, dated 1518, and thought by some, with little foundation, to have been worked on a plate of iron. Another etching by

the same artist is Moses receiving the Tables of the Law, dated 1524. It was also practised in Italy soon after this by Parmegiano, in whose etchings we discover the hand of the artist working out a system as it were from his own imagination, and striving to produce the forms he wanted to express. We see the difficulty he laboured under; and cannot doubt, from the examination of the mechanical part of the execution of his works, that he had no instruction; and that it was something entirely new to him. If the story is true, that he kept an engraver by profession in his house, the novelty of the art is rendered so much the more probable. He died in 1540.

As to that species of engraving in which the modes of *etching* and *cutting* with the graver are united, it must have been found necessary immediately upon the invention of *etching*; it was, however, first carried to perfection by G. Audran, and is now almost universally practised, whether the work is in strokes or in dots.

Engraving in *dots*, the present fashionable method, is a very old invention, and the only mode discovered by the Italians. Agostino de Musis, commonly called *Augustine of Venice*, a pupil of Marc Antonio, used it in several of his earliest works, but confined it to the flesh, as in the undated print of An Old Man seated upon a Bank, with a cottage in the back ground. He flourished from 1509 to 1536. We also find it in a print of "A single figure standing, holding a cup and looking upwards," by Giulio Campagnola, who engraved about the year 1516. The back ground is executed with round dots, made apparently with a dry point. The figure is outlined with a stroke deeply engraved, and finished with dots, in a manner greatly resembling those prints which Demarteau engraved at Paris in imitation of red chalk. The hair and beard are expressed by strokes. Stephen de Laulne, a native of Germany, followed the steps of Campagnola; and many of his slight works are executed in dots only. John Boulanger, a French artist, who flourished in the middle of the last century, and his cotemporary Nicholas Van Plattenberg, improved greatly on this method, and practised it with much success. It is only, however, of late, that it has been considered as an object worthy of general imitation. John Lutma executed this kind of work with a hammer and a small punch or chisel.

The method of engraving in *mezzotinto* was invented about the middle of the 17th century; and the invention has generally been attributed to Prince Rupert, though it has also been asserted that he learnt the secret from another. See MEZZOTINTO.

Of the method of engraving in *aquatinta*, a short and general account has already been given under that word. See AQUATINTA. But as some farther information relating to this branch of the art of engraving has fallen in our way, we embrace this opportunity of laying it before our readers.

Engraving in *aquatinta*, was originally invented by Le Prince, a French artist. For a long time, his process was kept secret; and his prints, it is said, were at first sold for drawings. As a proof that the art rose at once to perfection, as has already been mentioned, the prints

Engraving. prints which were executed by him, are still admired as the finest and best specimens of the art. It appears, however, that he was only acquainted with the powdered grain, and the common method of stopping out. The first who practised this art in England, was Mr Paul Sandby. By him, we are informed, it was communicated to Mr Jukes, whose works afford excellent examples to what perfection the art has been carried; and although it is now generally practised all over Europe, yet in no country with greater success than in Britain.

The principle of this process consists in corroding the copper in such a manner, that an impression from it exhibits the appearance of a tint laid on paper, or a drawing in Indian ink. This is accomplished by covering the copper with some substance which assumes a granulated form, and prevents the acid from acting where the particles adhere; and thus the copper is only partially corroded. The more minute the particles are, it is obvious the impression from the plate will more nearly resemble a wash of Indian ink, or a drawing; but the larger the particles are, the granulation becomes more distinct. The powder or granulation is called the *aquatinta grain*. It is produced in two ways.

The process for using the powdered grain, which was first employed, is the following. The outline being etched on a copper plate, some substance which easily melts with heat, adheres to the plate when cold, and resists the action of the aquafortis, is to be finely powdered and sifted. Besides asphaltum, rosin, and gum sandarac, the substances which have been mentioned in the article already referred to, Burgundy pitch, gum copal, gum mastic, as well as some other resins and gum resins, may be employed. Gum copal, it is observed, produces a grain which resists the aquafortis extremely well. Whatever the substance is which is to be employed, the great object of the artist in its application is, to have it equally distributed over the plate. This is an essential part of the operation, and requires considerable attention. The usual method is, to tie up a quantity of the powder in a piece of muslin, and to strike it against a stick held at a considerable height above the plate. Thus managed, the powder settles equally over it, in the same uniform manner that hair powder settles on the furniture of an apartment, where the operations of the hair-dresser are performed. The plate being thus covered equally with the dust or powder, it is to be fixed upon it, by the application of a gentle heat, to melt the particles. This is usually done by holding lighted pieces of brown paper, rolled up, and moving them about till the whole of the powder is melted, which is known by its changing to a brown colour. It is now allowed to cool and after being examined with a magnifying glass, if the particles appear to be uniformly distributed, the artist proceeds to the next part of the process.

Those parts of the design or drawing to be engraved, which are perfectly white, are to be observed and marked, and the corresponding parts of the plate must be covered or stopped out. This is best done by means of mastic varnish, diluted to such a consistence with turpentine as to work freely with the pencil. To give it colour, lamp-black should be mixed with it, that the touches of the pencil may be distinctly seen. When

those parts of the plate which are stopped out, are sufficiently dry, a border of wax is raised round the plate, in the same manner as in etching, and the aquafortis diluted with water is poured on. This being the most precarious part of the process, requires the greatest experience. When it is supposed that the aquafortis has remained on the plate for such a length of time, that when an impression is taken, it will produce the lightest shade in the drawing, it is poured off, and the plate is washed with water and dried. The lightest tints are then stopped out, and the aquafortis is again poured on; and this process is repeated as often as there are tints or shades to be produced in the plate.

Many plates are entirely etched in this way, by alternately stopping out and biting in. It is, however, found to be extremely difficult, and indeed impossible, to produce impressions of minute and complicated objects with the requisite degree of delicacy and freedom. To obviate this difficulty, another process has been proposed, by which the touches are laid on the plate, with equal ease and expedition as on drawings with Indian ink. Fine washed whitening is mixed with treacle or sugar, and diluted with water in the pencil, that it may work freely. This is laid on the plate covered with the aquatint ground, in the same way as ink on the drawing. When this is dry, the whole of the plate is varnished over with a thin turpentine or mastic varnish, and when this is dry, the aquafortis is poured on. The varnish immediately breaks up in those parts of the plate where the treacle mixture was laid, and thus they are exposed to the action of the acid, while the other parts of the plate remain untouched. Thus the touches or places of the plate where the treacle has been applied, are bit in deeper than the rest, and have the precision of touches done with Indian ink. The plate being thus completely bit in, the bordering wax is removed, by gently heating it with a piece of lighted paper. It is then cleared from the ground, and varnished by means of oil of turpentine; and being wiped clean with a rag and a little fine whitening, it is ready for the printer.

But in this method of aquatinting, it is found difficult to produce the necessary degree of coarseness or fineness in the grain; and plates which are engraved in this manner afford but a small number of impressions before they are worn out. On this account it is now more rarely followed.

The other method of producing the aquatint ground, which is most generally adopted, is the following. A resinous substance, as common resin, Burgundy pitch, or mastic, is dissolved in spirits of wine. This solution is poured all over the plate, which is inclined, till the whole of the superfluous fluid drains off, and what adheres to the plate becomes quite dry in a few minutes. The plate being then examined with a magnifying glass, it will appear that the whole of the spirit having evaporated, the resinous matter is left in a granulated state, or is cracked in every direction, and adheres strongly to the copper. In this way a regular and beautiful grain is easily produced, which will be found preferable, at least for most purposes, to that which is produced by the former method. The grain being thus formed, the other parts of the process are conducted in the same manner as before described.

Engraving.

Such are the usual methods of conducting this process. We shall add a few hints which the young artist may find useful in the different parts of it. With regard to the materials which are employed, it is to be observed, that the spirits of wine should be rectified, and of the best quality. Resinous matters, as common resin, Burgundy pitch, and gum mastic, yield grains of a different appearance and form; so that advantage may be taken of this circumstance, by using them sometimes separately, and sometimes mixed in different proportions, according to the views and taste of the artist. Different proportions of resin may be employed, to produce grains of different kinds. When a coarse grain is intended, a greater proportion is to be employed; and when a fine grain is wanted, a smaller proportion of resin only is required. The proper proportions may be ascertained by providing a number of spare pieces of copper; on these the liquid may be poured, and the grain examined, before it is applied to the plate which is to be engraved. After the solution is made, it should remain undisturbed for a day or two, till the impurities of the resin have subsided, and the liquid becomes quite limpid. This is the best method of freeing it from impurities; for if it is strained through linen or muslin, it is mixed with hairs, which are extremely injurious to the grain. It may be added, that the apartment in which the fluid is poured on the plate, should be perfectly still, and entirely free from dust; for if any fall on the plate while it is wet, the grain forms a white spot which cannot be removed. Great care should be observed in cleaning the plate. This is done with a bit of rag and whitening. The smallest stain or particle of grease produces a streak or blemish in the grain. Still, however, with all the attention which can be employed, and with the utmost delicacy in the management, it is necessary to observe, that the process is extremely precarious and uncertain; and even the most experienced artists find themselves frequently subject to very unaccountable accidents.

Phil. Mag.
vol. xxiii.
737.

Artists have frequently complained of the inconvenience from the fumes which proceed from the action of the acid upon the copper, when the plate is large. "To remedy this inconvenience, the following arrangement, which seems well calculated to answer the purpose, has been suggested by Mr Cornelius Varley, a young artist who distinguishes himself no less by his mechanical abilities than by the exquisite productions of his pencil in water colours.—Get a frame made of common deal or any kind of wood, three or four inches deep, covered with a plate of glass, and open at one side; and let the side opposite to this have a round opening communicating, by means of a common iron pipe, with the ashpit of any little stove or other fire-place, shut up from all other access of air but what must pass through the pipe. It is obvious that any fumes rising from a copper-plate laid under such a frame will be carried backward into the iron pipe by the current of air required to maintain combustion in the stove, and will by this means be carried up the chimney in place of being allowed to fly about in the apartment. The pipe may be very conveniently used by carrying it down through the table to the floor, and so along to the place where the chimney may chance to stand; and when the frame is not wanted, the pipe at one of the

Engraving. joinings may be made to answer the purpose of a hinge, by which to turn up the frame against the wall where it may be secured, while out of use, by a button or any other contrivance."

This method of engraving in aquatinta seems to be chiefly adapted for slight subjects in general, for imitations of sketches, and washed drawings. But for the production of prints from finished pictures, it is by no means calculated; because it is not susceptible of that accuracy in the nice management of the tints which is necessary for this purpose. It is equally unsuitable for book plates; because, without retouching the plates, the number of impressions that can be thrown off is very small. On these accounts, therefore, it is to be considered greatly inferior to the other modes of engraving. But as it is more expeditious, and may be attained with more facility, it is undoubtedly useful when it is confined to those subjects for which it is peculiarly calculated. This rapidity of execution, however, and facility in acquiring the practice of the art, are followed with the unfortunate circumstance, that they favour the production of an indiscriminate multitude of prints which, it is to be feared, may rather tend to vitiate the public taste.

Engraving with the tool was the kind originally practised, and it is yet retained for many purposes. For though the manœuvre of etching be more easy, and other advantages attend it; yet where great regularity and exactness of the stroke or lines are required, the working with the graver is much more effectual: on which account it is more suitable to the precision necessary in the execution of portraits: as there every thing the most minute must be made out and expressed, according to the original subject, without any license to the fancy of the designer in deviating from it, or varying the effect either by that masterly negligence and simplicity in some parts, or those bold sallies of the imagination and hand in others, which give spirit and force to history-painting.

The principal instruments used in engraving with the tool are, graters, scrapers, a burnisher, an oil-stone, and a cushion for bearing the plates.

Gravers are made in several forms with respect to the points, some being square, others lozenge; the square graver for cutting broad and deep, and the lozenge for more delicate and fine strokes and hatches. La Boffie recommends, as the most generally useful, such as are of a form betwixt the square and lozenge: and he advises, that they should be of a good length; small towards the point, but stronger upwards, that they may have strength enough to bear any stress there may be occasion to lay upon them: for if they be too small and mounted high, they will bend; which frequently causes their breaking, especially if they be not employed for very small subjects.

The burnisher is used to assist in the engraving on some occasions, as well as to polish the plates. It is seven inches in length, and made of fine steel well polished. The burnisher is formed at one end, and a scraper on the other, each about an inch and a half long from the point: betwixt them, about four inches of the instrument is made round, and serves as a handle; and is thicker in the middle than at the necks, where the burnisher and scraper begin, which necks are only one quarter of an inch in diameter. The princi-

pal

Engraving. pal application of it in engraving, besides its use in polishing the plates, is to take out any scratches or accidental defacings that may happen to the plates during the engraving; or to lessen the effect of any parts that may be too strongly marked in the work, and require to be taken down.

A cushion, as it is called, is likewise generally used for supporting the plate in such a manner, that it may be turned every way with ease. It is a bag of leather filled with sand, which should be of the size that will best suit the plates it is intended to bear. They are round, and about nine inches over, and three inches in thickness.

The cushion, made as above directed, being laid on the table, the plate must be put upon it; and the graver being held in the hand in a proper manner, the point must be applied to the plate, and moved in the proper direction for producing the figures of the lines intended: observing, in forming straight lines, to hold the plate steady on the cushion; and where they are to be finer, to press more lightly, using greater force where they are to be broader and deeper. In making circular or other curve lines, hold your hand and graver steadily; and as you work, turn your plate upon the cushion against your graver, otherwise it will be impossible for you to make any circular or curved line with that neatness and command of hand you by this means may. After part of the work is engraved, it is necessary to scrape it with the scraper or graver, passed in the most level direction over the plate, to take off the roughness formed by the cutting of the graver; but great care must be taken not to incline the edge of the scraper or tool used, in such a manner that it may take the least hold of the copper, as it would otherwise produce false strokes or scratches in the engraving: and that the engraved work may be rendered more visible, it may afterwards be rubbed over with a roll of felt dipped in oil. In using the graver, it is necessary to carry it as level as possible with the surface of the plate; for otherwise, if the fingers slip betwixt them, the line that will be produced, whether curve or straight, will become deeper and deeper in the progress of its formation; which entirely prevents strokes being made at one cut, that will be fine at their extremities, and larger in the middle; and occasions the necessity of retouching to bring them, to that state. For this reason, it is very necessary for those who would learn to engrave in perfection, to endeavour, by frequent trials, to acquire the habit of making such strokes both straight and curving, by lightening or sinking the graver with the hand, according to the occasion. If, after finishing the design, any scratches appear, or any part of the engraving be falsely executed, such scratches, or faulty parts, must be taken out by the burnisher, and further polished, if necessary, by the above-mentioned roll.

The plate being thus engraved, it is proper to round off the edges, by using first a rough file, and afterwards a smoother; and to blunt the corners a little by the same means: after which, the burnisher should be passed over the edges to give it a farther polish.

The dry point, or needle, which has been of late much used in engraving, is a tool like an etching point, which being drawn hard on the copper, cuts a stroke,

and raises a burr; the burr is scraped off, and there remains a stroke more soft and delicate than can be produced in any other way. *Engraving.*

In the conduct of the graver and dry point consists all the art; for which there are no rules to be given; all depending on the habitude, disposition, and genius, of the artist. However, besides the explanations already given, some general observations and directions may not be improper. As the principles of engraving are the same with those of painting, a person cannot expect to attain any considerable degree of perfection in this art who is not a good master of design; and therefore he ought to be well acquainted both with perspective and architecture: for the former, by the proper degradations of strong and faint colours, will enable him to throw backwards the figures and other objects of the picture or design which he proposes to imitate; and the latter will teach him to preserve the due proportion of its several orders, which the painter often entrusts to the discretion of the engraver. In order to preserve equality and union in his works, the engraver should always sketch out the principal objects of his piece before he undertakes to finish them. In working, the strokes of the graver should never be crossed too much in a lozenge manner, particularly in the representation of flesh, because sharp angles produce the unpleasing effect of lattice-work, and take from the eye the repose which is agreeable to it in all kinds of picturesque designs: we should except the case of clouds, tempests, waves of the sea, the skins of hairy animals, or the leaves of trees, where this method of crossing may be admitted. But in avoiding the lozenge, it is not proper to get entirely into the square, which would give too much of the hardness of stone. In conducting the strokes, the action of the figures, and of all their parts, should be considered; and it should be observed how they advance towards, or recede from the eye; and the graver should be guided according to the risings or cavities of the muscles or folds, making the strokes wider and fainter in the light, and closer and firmer in the shades. Thus the figures will not appear jagged; and the hand should be lightened in such a manner, that the outlines may be formed and terminated without being cut too hard; however, though the strokes break off where the muscle begins, yet they ought always to have a certain connection with each other, so that the first stroke may often serve by its return to make the second, which will show the freedom of the engraver.

In engraving the flesh, the effect may be produced in the lighter parts and middle tints by long pecks of the graver, rather than by light lines; or by round dots; or by dots a little lengthened by the graver; or, best of all, by a judicious mixture of these together.

In engraving the hair and the beard, the engraver should begin his work by laying the principal grounds, and sketching the chief shades in a careless manner, or with a few strokes; and he may finish it at leisure with finer and thinner strokes to the extremities. When architecture or sculpture is to be represented, except it be old and ruinous buildings, the work ought not to be made very black; because, as edifices are commonly constructed either of stone or white marble, the

Engraving. the colour, being reflected on all sides, does not produce dark or brown shades as in other substances. White points must not be put in the pupils of the eyes of figures, as in engravings after paintings; nor must the hair or beard be represented as in nature, which makes the locks appear flowing in the air; because in sculpture there can be no such appearances.

In engraving cloths of different kinds, linen should be done with finer and closer lines than any other sorts, and be executed with single strokes. Woollen cloth should be engraved wide, in proportion to the coarseness or fineness of the stuff, and with only two strokes; and when the strokes are crossed, the second should be smaller than the first, and the third than the second. Shining stuffs, which are generally of silk or satin, and which produce flat and broken folds, should be engraved more hard and more straight than others, with one or two strokes, as their colours are bright or brown; and between the first strokes other smaller must be joined, which is called interlining. Velvet and plush are expressed in the same manner, and should always be interlined. Metals, as armour, &c. are also represented by interlining, or by clear single strokes. In architecture, the strokes which form the rounding object should tend to the point of sight; and when whole columns occur, it is proper to produce the effect as much as possible by perpendicular strokes. If a gross stroke is put, it should be at right angles, and wider and thinner than the first stroke. In engraving mountains, the strokes ought to be frequently discontinued and broken, for sharp and craggy objects; and they should be straight, in the lozenge manner, and accompanied with long points or dots; and rocks should be represented by cross strokes more square and even. Objects that are distant towards the horizon should be kept very tender, and slightly charged with black. Waters that are calm and still are best represented by strokes that are straight, and parallel to the horizon, interlined with those that are finer: omitting such places as, in consequence of gleams of light, exhibit the shining appearance of water; and the form of objects reflected from the water at a small distance upon it, or on the banks of the water, are expressed by the same strokes, retouched more strongly or faintly as occasion may require, and even by some that are perpendicular. For agitated waters, as the waves of the sea, the first strokes should follow the figure of the waves, and may be interlined, and the cross strokes ought to be very lozenge. In cascades, the strokes should follow the fall, and be interlined. In engraving clouds, the graver should sport when they appear thick and agitated, in turning every way according to their form and their agitation. If the clouds are dark, so that two strokes are necessary, they should be crossed more lozenge than the figures, and the second strokes should be rather wider than the first. The flat clouds, that are lost insensibly in the clear sky, should be made by strokes parallel to the horizon, and a little waving; if second strokes are required, they should be more or less lozenge; and when they are brought to the extremity, the hand should be so lightened, that they may form no outline. The flat and clear sky is represented by parallel and straight strokes, without the least turning. In landscapes, the trees, rocks, earth, and her-

bage, should be etched as much as possible; nothing should be left for the graver but perfecting, softening, and strengthening. The dry point produces an effect more delicate than the graver can, and may be used to great advantage in linen, skies, distances, ice, and often in water, especially in small engravings. In most things it is proper to etch the shadows, only leaving the lighter tints for the dry point, graver, &c.

To imitate *chalk-drawings*, a mixture of varied and irregular dots are used; made more or less soft, so as to resemble the grain produced by the chalks on paper. Every stroke of the chalks on paper may be considered as an infinite number of adjoining points, which are the small eminences of the grain of the paper touched by the chalk in passing over it. When the copperplate has been polished and varnished, or properly prepared, as in the common method of engraving, the drawing to be imitated may be counterproved on the varnish of the plate. If this cannot be conveniently done, black lead pencil, or red chalk, must be applied to varnished or oiled paper; and by means of this chalk or pencil, all the traces of the original will be transmitted to the varnish. The outlines of the object must be formed in the etching by points, whose magnitude and distance must be determined by the quality of the strokes in the original drawing. The artist may be provided with pointed instruments or needles of various sizes with single or double points. In forming the light and shade, he should distinguish between those hatches which serve to express the perspective of the object and those which form the ground of it. The principal hatches should be more strongly marked; the middle tints, if etched, should be marked lightly, or they may be left till the varnish is taken off, and be perfected with a greater degree of softness by needles or the point of the graver, as the original may require. There is nothing peculiar in the method of applying the aquafortis in this kind of engraving; but it may be observed, that it should not be left so long as to corrode the lighter parts too much: if the light parts are sufficiently corroded, they may be stopped up with turpentine varnish and lamp-black mixed together, and the aquafortis may be applied again to the stronger parts; for it will be no detriment to them, if the points which compose the shade burst into one another, provided the extreme be avoided. When the work of the aquafortis is finished, and the varnish taken off the copper, it will be necessary in the softest parts, such as the flesh, &c. to interstipple with proper points; as an effect will be thus produced more delicate than it is possible to attain with the aquafortis only; and the strongest shades will require additional strength to be given them with small strokes of the graver. Drawings made with chalks of different colours may be imitated in this manner, if a plate be provided for every colour.—This method of engraving is intended to form a kind of deception, so that the connoisseur may not be able, on the first inspection, to distinguish between the original drawing and the engraving made in imitation of it; and it is extremely useful, as it serves to multiply copies of drawings left by those masters who excelled in the use of chalks, and thus to form and improve young artists, who could not have access to the originals in the practice of drawing.

Engraving. To this account of the history and practice of the art of engraving, we shall annex the following ingenious observations by an eminent living artist (A). We present them to our readers without alteration or abridgement.

On the linear art in general.

WHEN compared with painting, the art of engraving is but a recent invention, being coeval only with that of printing; and like that noble art, it possesses not only a similar but a greater power, of multiplying and extending the productions of genius over the world; for its language is universally understood.

It would have been well for the arts, if it could boast of a more remote date, as we might then have had many more of the finest designs of the first painters of antiquity, now doomed to oblivion, saved from the rude ravages of time.

But this invention seemed to be reserved for the fourteenth century, and its improvements for the age of Louis XIV. an age in which a number of artists, who may be said to have invigorated the art, and invested it with beauty, arose both in France and Italy.

Lines, in the first state of the art, like every other pursuit, whose excellence is progressive, were comparatively rude and unmeaning, and had nothing more to recommend them, than merely representing a particular sort of markings, or slight hatchings with the pen, without any other apparent degree of execution or expression. Although it is our pride to acknowledge, that it has not been a little beholden to the elegant etchings of the great masters in painting, as well as to their drawings in pen and ink, in its early stages, by which means an eminent degree of taste was introduced into the art, particularly in the department of linear disposition. Amongst those, the drawings of a Raphael, Michael Angelo, and the learned da Vinci; some of which we have occasionally seen and admired. Some by da Vinci were hatched in a square but delicate manner, with a white fluid, on dark coloured paper. Those of Michael Angelo and Raphael inclined more to the lozenge, in black or brown ink. They even carried this style of hatching with the pencil into their pictures, some of which adorn the Vatican; and in the famous cartoons in his majesty's collection by Raphael. Baccio Bandinelli generally hatched his lines in one direction, particularly a Taking down from the Cross, which was sold in London at the sale of the late Sir Joshua Reynolds's drawings. Vicenzio Dante, hatched in a similar way about the year 1550. Julio Romano used also to draw in this style with the pen, several of which are still to be found in the most select cabinets of men of taste; and for near a century and a half after the invention of etching, it is rare to mention a painter of eminence, who was distinguished in drawing, who did not annex this art to that of painting. But with the application of the burin, the art has been gradually improving till the present period. (B) Linear engraving is nothing more than drawing elegantly on copper. It became more studied as it was found capable of representing the various appear-

VOL. VIII. Part I.

ances of nature. The texture or surface of objects became proportionally discriminated by such peculiar modifications of the line, as seemed most suitable to the subject represented, although, at the same time, it rendered it much more arduous in the execution. Hence arose that diversity of style, and that scope for succeeding excellence, which, by combining elegance with simplicity and beauty, distinguished those artists who have been most conspicuous in its improvement.

It has been said, that we are indebted for the origin of this art to an ingenious Florentine, Maso Finiguerra, the sculptor. He was succeeded by a number of other ingenious men, among whom we rank Botticelli, Andrea Mantegna, and other able designers;—and in Germany, Albert Durer, Aldgrave, and Lucas Van Leyden, who severally contributed their labours. But in the fifteenth century, the works of the divine Raphael began to be multiplied by the correct graver of Marc Antonio, an artist whose prints were the delight of that great painter. Antonio had many imitators, but none who equalled him for justness of contour, for which his works will be ever highly appreciated among the early productions of the art.—Having had occasion to mention a few of the principal artists who reared the scaffolding of this elegant art, we shall proceed to those who have so much distinguished themselves in finishing the superstructure. Among those, Augustino of Venice began to introduce a better disposition of line in his shades, as well as the ingenious Bolognese, Augustino Carracci; whilst Egedius Sadeler displayed no less zeal in Germany. In the sixteenth century, the art displayed still more vigour and taste, and seemed to have but little more wanting; for all that meagre dryness of line began to disappear, which so manifestly marks the early works of Il Tedesco, Aldegraff, and other artists of a former period. Their works became consequently more rich in style, by embracing the best productions of the pencil; and as they were applied to a greater number of ideas, they became still more interesting and successful.

Patrons were numerous and liberal; and it is but proper to remark, that the various artists, on their part, actuated by a becoming zeal which was highly creditable to themselves, were indefatigable. This is a circumstance not less worthy of imitation, than the many admirable monuments of the art which they produced. Few but admired the works of Masson, Poilly, Nantueil, and Rousselet; and some time after the death of the ingenious Cornelius Bloemart, who had given a grace to his lines, hitherto unknown at Rome, the matchless Audran and Edelinck displayed their excellent productions at Paris. But arts are liable to fluctuate; and when the art of engraving began to decline abroad, it gradually displayed a high degree of lustre in our own country; and the variety of styles which has since sprung from the original manner of engraving shall be the subject of the following sketch.

We shall therefore treat more particularly of the disposition of the lines and their consequent effects, distinguished

(A) Francis Legat, Esq. historical engraver to his royal highness the prince of Wales, and F. A. S. E.

(B) The author has taken the liberty of here adopting the word *linear*, from its strict analogy to this mode of engraving, and with the approbation of some of the first professors, both in painting and engraving.

Engraving distinguished by the terms, *linear expression, imitation, disposition, and harmony*; with a strict investigation of the first and most approved subjects, either in etching or engraving; and of their essential beauties, as far as they may tend to illustrate the subject.

On linear expression and disposition.

As the great object of this mode of engraving is, to adopt those lines the most expressive of the form and character of whatever happens to be represented, by maturely investigating not only the action but the cause and correspondent effects of the original picture; in order that the artist may avail himself of all that is most beautiful in his translation, and efficient in the aggregate, either with respect to the expression, spirit, or sentiment.

When historical subjects consist of several figures, where there is generally a variety of draperies, some of them appearing thick and cumbersome, others more thin and flexible, sitting close and elegant on the limbs, being composed of a finer texture, or thread; the coarser stuffs are consequently more effectually represented by a bolder line, as the thinner sort, by the application of a fine line, gives a more lively representation; a discrimination which has been observed of late, by the most approved modern artists in linear engraving. Observations of this description, when treated in a liberal manner, not only superadd a degree of truth, but even render the subjects sweeter to the eye of fancy. In the early stages of the art, some excellent artists have been led into particular and limited systems. In the works of such as have affected to describe every subject in the same line indiscriminately, even the arms of the most delicate women are often engraven as if perfectly polished, by approaching to a metallic appearance, a mode not uncommon among the second or third class of artists about the beginning of the last century; by which manner, all that softness and delicacy was neglected, which is so happily effected in the linear productions of Bartolozzi, Morgan, Sharp, Heath and others, at present of the first masters in Europe. Those who are acquainted with the works of the ingenious Chaffard, must with pleasure have perceived in his foliage, how even the texture of flowers are imitated from the delicate line-like fibres of which they are composed, issuing from the stem, and spreading their silken beauties to the sun: and in this class of imitation, the clear transparency of glass, the rough texture of woollen, the thinness of lawn, the flickerings of satin, or the lightnings of steel, as well as the rude rock, the lucid lake, or the flashing of the torrent, are all admirably adapted to linear effect by the almost infinite diversity in their construction, and general constituent principles, strictly observing on what laws the beauty of lines consists, by ever keeping in view the due balance of taste, and a noble simplicity of style throughout. It is the business of the skilful artist to overpower and subdue the difficulties in his profession; for no excellence in art is of cheap or vulgar acquisition. Let it be remembered that with forming steel, even the enchanting graces of the Venus de Medicis were hewn from a rock, and the almost breathing Apollo, from a block of Parian stone.

An elegant English poet, in a critical essay on poetry, observes, that the sound should seem an echo to the sense; so should the lines in a fine print seem to harmonize with the subject, by flowing with the external cast of the features, and the predominant passion ex-

pressed in the original picture; for the same character and disposition of the lines that suit the action of the muscles in one passion, will be found to appear more vacant and less expressive when applied to others, however graceful they may appear.

As this is a point of view to which the art has never yet been fully extended, perhaps it may meet with some degree of attention, as it will be found of utility in forming a principle respecting disposition, more particularly in historical subjects, where the passions are required to be nicely expressed: and although it may admit of some slight exceptions, it is a principle that will in general be found to be true.

For example, let it be supposed, that the passion of the figure represented, is that of joy; the lines should seem to expand and swell, with every acting muscle, in the most delicate manner possible.

But, on the contrary, if the subject displays deep sorrow, they should rather incline downward, partaking somewhat of the half straight, seeming to act apparently in perfect unison and conformity with the features of the face, with all due subordination to the general effect of light and shadow.

Various observations may be made in this manner on the principal passions expressed in the human countenance, which are but few comparatively, even from the slightest movement to the boldest action. We often find, on examining the works of those masters who are not so conspicuous for great clearness of execution, that they have been occupied by the disposition and energy of the lines, as in the magnificent and masterly prints of the battles of Alexander, from the pictures of Carlole Brun, engraved by Gerrard Audran; where the executive department is no less conspicuous from the burin of the Chevalier Edelinck in the fine print of the tent of Darius: whilst Audran displays the true spirit of art, but rarely avails himself of much of the mechanical principles. The field, and tumult of battle, seemed admirably calculated to call forth his rapid powers, particularly in works of magnitude.

The less active scenery of the tent of Darius, was equally appropriated to the splendid talents of Edelinck; as he seems to have been better qualified to display subjects of that nature in general. This is sufficiently obvious from the beautiful and interesting groupe of the queen mother, and her illustrious family, kneeling at the feet of the conqueror; his impressive print of the magdalene, or his most admirable portraits of the dignified clergy, distinguished authors, and eminent artists. These, in point of engraving, are no less remarkable for taste in the execution, than for truth and nature in expression.

In one of the battles of Alexander, the groupe where Porus is wounded and supported by the soldiers, the rough discrimination of line finely accords with that bold deportment of character in the grim visage of that gigantic prince, whilst a more delicate line marks the youthful countenance of Alexander; a discrimination which is totally lost in the large Dutch copy by de Vos.

In the same print, the figures of Alexander and Clytus, are finely relieved from the distant scenery by the varied description of engraving on their armour, drapery, and horses. The latter are managed with such freedom and spirit, that it is difficult to say whether the horses or figures seem the most with masterly execution; particularly

Engraving. particularly the white war-horse on the right extremity of the print (c).

Had Audran superadded a still greater portion of the delicacy and clearness of handling so conspicuous in Edelinck and other eminent artists since that period, it would undoubtedly have given an additional beauty to his other transcendent acquisitions; namely the vast spirit of his lines, and power in drawing.

But it is seldom the lot of an individual to combine every excellence. Arts too have their infancy; for they generally require the labour of ages to bring them to maturity and perfection, and it yet remained to unite and ameliorate the polish of Edelinck, to the spirited style of Audran. Without prejudice or partiality, a considerable degree of this excellence will be found in the best works of British art, as we shall hereafter exemplify.

Another fine specimen of lineal engraving, and of a different class, is the celebrated storm by Balechow, from a picture of the famous Vernet. In this print he has transmitted with the graver a certain fluidity and action in representing the liquid element, to which the art had never before attained. To a grandeur of style in the bold swelling of the waves, he has superadded the utmost transparency of line; at the same time, having attended to all that light restless spray which seems sporting to the gales as they roll along. In a fanciful mood, one might almost imagine they heard the motion of the water: so finely did this discriminating artist translate, (if I may be allowed the expression) this admirable picture.

When we consider the period in which this distinguished work was engraved, and that little or nothing had been previously done in that department of a similar excellence; it is hoped it will be a sufficient apology for the degree of admiration here expressed: for, as Lord Verulam truly observes, "we are too prone to pass those ladders by which the arts are reared, and generally reflect all the merit to the last new performer." We have already observed, they are seldom reared with rapidity, and oftentimes that which is considered an invention, is only a long succession of trials and experiments, which have gradually followed each other, and ought rather to be considered as a series of human mind than the knowledge of an individual, being the works of ages. In any point of view, the present subject will ever be considered as a high improvement and an elegant acquisition in the annals of the linear art. But in historical subjects this artist is by no means equal in point of taste or discrimination. His print of St Genevive undoubtedly ranks high in the first classes of engraving. Had his taste in other respects been equal to his powerful clearness of execution, it would have been almost unparalleled; but it betrays a want of that essential, even in his mode of thinking. Patience and labour are everywhere too prevalent. It remained for Woollet to excel both in figures and in landscape.

In the various styles and modifications of this expressive art, from the NEAT to the FEEBLE, and from the BOLD to the EXTRAVAGANT, *Taste* stands sole arbitress: in brief, it is she who distributes variety with spirit, and conceals the appearance of intricacy and labour; who, by a due

Engraving. modification of line, unites clearness to softness, arresting the hand of the skilful artist, from every effort inconsistent with her powers; producing at once to the mind all that agreeable finished combination or harmony which ever accompanies and constitutes the perfection of true art.

In the execution of subjects of imagination, there is a perpetual scope for calling forth the fancy of the engraver, as the various combinations of lines are inexhaustible, uncommon effects, such as aerial spirits, or celestial beings blended with the light, or ghosts commingled with the gloom, or fairy elves by moonlight, who trip the sands, and yet no footing seen; or wood-nymphs, laving their taper limbs in the limpid element. Such subjects, in point of style, depend entirely upon the beauty, lightness, and transparency of execution; for those that are merely ornamental or grotesque, demand a style of a different cast from that of the serious or historical, as they require a less degree of truth even from the burin. In these cases the style may be as capricious as the subjects. Those of Raphael, in the Vatican, display an uncommon degree of taste, and particularly in the elegant flow of line with which they are composed.

In all works of taste and genius, those which may appear the most simple at a transient glance, will be often found to contain the most art on a more mature investigation. The first impression may strike the fancy, but the second generally calls up the discriminating powers of the judgment.

Arts generally rise in our esteem according to the degree of exertion of the mental powers which they require; and, as lines are capable of various styles, those which are most congenial to the subject represented ought to be adhered to in preference to every other consideration. Teniers, and Gerrard Douw, demand all the fidelity and delicacy of the burin in describing the various draperies and individualities which belong to that class of painting; but, in proportion as the contour is composed of fewer parts, and the forms more full and elegant, the beautiful flowing qualities of the graver is increased, and its lines glide more gracefully over the figures, as may be found in the works of Strange and others from Guido and Corregio. This distinction will not appear so obvious on a superficial view of the art. But, on a due investigation, it will be found, that not only a different modification of lines is necessary to the various classes of painting, but that even a different description of style is requisite to characterize some of the masters in each particular class, from the sublime and elevated figures of a Raphael and Michael Angelo, to the simple cottagers of Adrian Ostade.

When we take a more comprehensive view of the art, we often find, that the styles which are adopted in the different countries in Europe by the artists where the art has in any degree been cultivated, are generally regulated by the modes of painting, drawing, and even the colouring respectively in each, whether historical, portrait, or landscape, and is proportionably appreciated according to the effective beauty and elegance of the execution.

(c) Whenever Mr Bartolozzi happened to speak of those prints to me, he always expressed himself with a great degree of enthusiasm, thinking himself extremely fortunate in having works of such excellence in his possession.

Engraving. It is not improbable that the clear mode, which at present constitutes the modern German school, is a refinement on the simple style of Cornelius Bloemart.

In Italy, Jachimo Frey, that astonishing Swiss, from his masterly expertness in drawing, and a rapid use of the etching steel and the nitre, almost produced an entire revolution in the art. The unprecedented richness and ease, the freedom and energy of his style, and the number and magnitude of his works, attracted all Italy, and tended greatly to improve the Roman school. About the year 1672, we find him working jointly with the nervous Dorigny Frezza, and Vanauden Aird. From this source we can perceive the style of Wagner, of Cars in France, and various masters now living; namely, Francisco Bartolozzi, Giovanni Volpato, Dominicus Cunigo, and some of the early works of the excellent Raphael Morghen.

In many instances Frey indicates, that if he had considered it of sufficient consequence to the art, he could have engraved with more clearness, particularly by his curious copy from the celebrated print by Edelinck, of the Madona and Child, with St John and Angels, from Raphael; and although but an imitation of another style, tends to shew the versatility of his talents, when the judgment is for a while suspended to know which is the original. We find a performance of Frey's, entitled *La Charité Humaine*, dated 1723; a print was afterwards engraved from the same subject at Paris by Daulle, dated 1763, in which he has rather been too profuse in the mere mechanical part of the art, and destitute of that ardour which a well engraved work should not only inspire but maintain.

It is not enough for lines to be only well disposed, but also full of expression: neither is it enough for a line to be only clearly cut, but it must also be free; for in a certain free light spirited lines convey an idea of animation, and are suited to subjects of that description, while the long sweeping and bold lines are better adapted to the solemn and majestic productions of the pencil.

A fine print, like a miniature picture, ought to be viewed near the eye: as in itself, from the nature of the art, will be found a due subordination of effect, ever receding from the bold and articulated lines in the fore ground to those which are more evanescent and remote.

The graceful birch, the mountain ash, and the oak, have each their peculiar bark and texture; and these, when freely indicated, stamp their mark and character most completely to the eye. Much of this, as has been formerly mentioned, depends upon, and is regulated by, the peculiar style of the picture and the skill of the engraver.

As lines seem to partake of motion, in proportion as they deviate in gentle bendings from the straight and precise; even so also, in the motion of water seemingly increased, whether they undulate with the simplest wave, or swell with the fierce and tempest-curl'd surge. This character is sufficiently illustrated in the works of Balechow and Woollet.

In the late Mr Brown's large print of St John preaching in the wilderness, no engraver has ever more

fully displayed the true spirit of Salvator Rosa, particularly in the original mode of treating the rocks, and the bold style of the surrounding scenery; in short, in the aggregate it is a chef d'œuvre unparalleled in any country. This is freely acknowledged, not only by every man of taste, but by the first landscape engravers. (D).

But Brown was perhaps less happy in the companion to the above, from the celebrated *Both*, by adapting a similar mode to that finished and delicate painter. For the style should ever vary with the subject.

"Whate'er Lorraine light touched with softening hue,
Or savage Rosa dash'd, or learned Poussin drew."—

THOMSON'S *Castle of Indolence*.

His admirable etchings of the cottager and its companion, and the Celadon and Amelia, are fine specimens of his discriminating powers, and characterized with so near an approach to truth, that we cannot help exclaiming with the poet,

"He sees no other, nature's self who sees."

The engraving of the above subjects was finished by the matchless Woollet, with the same happy taste. And it must be acknowledged that it is but seldom that we see so many excellencies united; for it is equally rare to see the finest engraving united to the finest drawing, as to find it in painting combined with the choicest colouring: yet each have their decided fascinations in the gallery, the cabinet, or the portfolio.

Woollet, whose works abound with nerve and intelligence in point of character, his style of landscape is delightfully descriptive; whether rocks, water, trees, or sky; as the Niobe, the Ceyx, and Alcyone, and other master-pieces from the great Wilson evince. In the winter scene from Smith of Chichester, he has admirably contrived to convey the effect of the drifted snow, by delicate dotting, and with no less precision he has described the transparent ice with clear lines. Of trees, he was the first that ever faithfully characterized the graceful larch; as may be seen in his views of the noblemen's seats. In the print of the fishery, he is indebted to the masterly etching of John Brown, particularly the shipping, in which there is perhaps no subject more articulate and perspicuous. The engraving of this subject is finished by himself. In his figures he was the founder of a style, most happily adapted for modern dresses, and historical portraiture; a style in which he moved with unrivalled reputation. His print of the death of General Wolfe, painted by Mr West, is an admirable example, and does honour to the British nation. It occupied him no less than four years. The print of the battle at La Hogue is another fine specimen of his knowledge of linear discrimination. In short, when we consider the talents of this artist, it is difficult to decide whether he most excelled in modern history or landscape. The art has to regret that he, who was so eminently qualified to adorn any line of the profession, has left no works in ancient history. We have little doubt from his knowledge, and a real love of the art, he would have left a sufficient monument in that department also, for the pleasure and contemplation of the

(D) Were I at liberty to mention eminent living artists, I would have been induced here among others, to have mentioned the subject of the Tempest in the Twelfth Night, from the late ingenious Wright of Derby, engraved by Mr Middleman, in the Messrs Boydell's large edition of the immortal bard of Avon.

Engraving. the real connoisseur and of posterity. Engraving in this country sustained a heavy loss when he died; and if the death of so excellent an artist may be considered as a public loss, it is certainly the more felt with respect to Woollet, who died while he was yet improving in that excellence (E).

Chattelaine has been termed a mannerist in his drawings, but he must certainly be allowed to be an excellent one: his etchings are variety itself. Perhaps in the department of etching no artist has so happily translated the pictures of Claude de Lorraine as Francis Vivares; that is, with respect to aerial perspective, the peculiar characteristic of Claude. But his merits are not confined to this master alone; for he followed Ruyssdale, Berghem, Gainsborough, and Cuype, with great success. He has such a free delivery of style, that almost every one who examines his works is irresistibly impressed with an idea of performing the very same. Few artists, it has been mentioned, have excelled in the etching department. We cannot, however, omit the name of Peranezzi; who, to originality of style, which is apparently spontaneous, joins a certain grandeur which had never been surpassed. He has transmitted to posterity so spirited a representation of the Greek and Roman edifices and ruins, that travellers have often confessed that they have raised their ideas beyond the magnitude of the superstructures themselves. It is certain that in works of this stupendous nature, a degree of ruggedness in the execution corresponds with the sublimity of the subjects; and thus produces a still greater power over the mind, than if they had been more polished. Some have censured his figures, and not without cause. This defect has been ingeniously palliated by an excellent artist, Mr Bartolozzi. "For (said he) if the purchasers of the works of Peranezzi, get so much for their money in the building way, the figures may be supposed to be given for nothing." Doubtless those vast piles of perishing grandeur, were never more judiciously presented to the eye, than by this astonishing artist, or better calculated to affect the mind by calling forth its most sublime ideas.

We have another striking instance of spirited etching in a different pursuit of the art, in the works of Ridinger, a name which brings along with it all the savage scenery of nature.

"Assembling wolves in raging troops descend.
—— They fasten on the steed and pierce his mighty heart."

THOMSON'S *Winter*.

For we shall ever find some peculiar beauty to admire, even in the slightest productions of genius, as well as in the most perfect productions of the burin.

There are few artists who do not regret, that etching was unknown to Bolswert, who has done so much without its aid; from which we may easily suppose how much more he could have effected with this charming acquisition. For the truth of this remark we may appeal to his landscapes from Rubens, his animated portraits from Vandyke, and his productions from the Fle-

Engraving. mish school of history, particularly his large print of the taking down from the cross from Rubens.

There is a fine instance of linear effect in a print of a Flemish conversation piece by Wille. One of the figures is drinking out of a glass, and the artist has most deceptively described the texture of the drinker's face through the glass. In the same print, a female figure shews great skill in this way, even the floor is characterized by lines; and the whole strongly marks the most proper mode of treating subjects of a mere local nature. The beautiful print of the *Petit Physicien*, is also an admirable imitation, particularly the little pellucid globule which has just mounted from the shell. When lines are engraved in a square acute method of crossing, they generally convey the idea of hardness to the subject represented. The scientific Picart seems to have been so much aware of this, that in a print of his engraving of a large marble groupe of horses, from the animated chisfel of Pezriere, he adopted this style in order to heighten the imitation.

Mafon's print of Marshal Harcourt, is one of the many fine efforts of portrait engraving; and although it was executed at an early period of the art, it abounds with no small degree of taste. The celebrated print (called the table-cloth) from Titian, of the Last Supper, also contains a considerable degree of linear discrimination, although he sometimes carries it to affectation. He is rather singular in his mode of engraving hair. Yet the portraits of Marshal Harcourt and Brisafiere the secretary may be deemed exceptions.

Wille, by the magic of his tooling, is too apt at times to give his works indiscriminately the appearance of bronze; and we frequently find the same in the figures of Balechow: but it seems to have been reserved for Strange to give the softness of carnation to copper; and to Woollet, to give force and clearness with discriminating taste. Bartolozzi in his lines elegance delicacy and drawing; while the works of Audran teem with boldness and simplicity. In the prints of Sir Robert Strange, the greatest excellence is perhaps his rich and harmonious tones, as well as the whole effect, which is supported by an expressive style; which he seems in a great measure to have invented for his most favourite painters, Corregio, Titian, Guido, and Guercino. The softness, the gusto, and the flowing draperies in the works of these masters, were his delight. His sleeping Cupid from Guido, and the prints of the Venus and Danae from Titian, will ever be esteemed as *chef d'œuvres* in the linear art.

Having thus attempted to fulfil our original intention of discriminating the most expressive combinations of lines, and of analyzing and illustrating their various powers and effects in engraving, we shall now conclude these observations; and if, from the nature of the subject, and from the limits of the sketch, we have failed in marking every brilliant star in the galaxy of the art; it must at least be acknowledged, that we have not omitted some of those of the first magnitude.

ENGRAVING upon Glass. See *GLASS, Engraving on*.
ENGRAVING

(E) Although we are now contemplating linear engraving, it is but proper here to observe, that chalk engraving, mezzotinto, and aquatinta, have also made ample improvements in this country, in their various styles of excellence.

Engraving.† *ENGRAVING on Precious Stones*, is the representing of figures, or devices, in relievō, or indented, on divers kinds of hard polished stones.

The art of engraving on precious stones is one of those wherein the ancients excelled; there being divers antique agates, cornelians, and onyxes, which surpass any thing of that kind the moderns have produced. Pyrgoteles among the Greeks, and Dioscorides under the first emperors of Rome, are the most eminent engravers we read of; the former was so esteemed by Alexander, that he forbade any body else to engrave his head; and Augustus's head, engraven by the latter, was deemed so beautiful, that the succeeding emperors chose it for their seal.

All the polite arts having been buried under the ruins of the Roman empire, the art of engraving on stones met with the same fate. It was retrieved in Italy at the beginning of the 15th century, when one John of Florence, and after him Dominic of Milan, performed works of this kind no way to be despised. From that time, such sculptures became common enough in Europe, and particularly in Germany, whence great numbers were sent into other countries: but they came short of the beauty of those of the ancients, especially those on precious stones; for, as to those on crystal, the Germans, and, after their example, the French, &c. have succeeded well enough.

In this branch of engraving, they make use either of the diamond or of emery.

The diamond, which is the hardest of all stones, is only cut by itself, or with its own matter. The first thing to be done in this branch of engraving is, to cement two rough diamonds to the ends of two sticks big enough to hold them steady in the hand, and to rub or grind them against each other till they be brought to the form desired. The dust or powder that is rubbed off serves afterwards to polish them, which is performed with a kind of mill that turns a wheel of soft iron. The diamond is fixed in a brass dish; and, thus applied to the wheel, is covered with diamond dust, mixed up with oil of olives; and when the diamond is to be cut facet-wise, they apply first one face, then another, to the wheel. Rubies, sapphires, and topazes, are cut and formed the same way on a copper wheel, and polished with tripoli diluted in water. As to agates, amethysts, emeralds, hyacinths, granites, rubies, and others of the softer stones, they are cut on a leaden wheel, moistened with emery and water, and polished with tripoli on a pewter wheel. Lapis-lazuli, opal, &c. are polished on a wooden wheel. To fashion and engrave vases of agate, crystal, lapis-lazuli, or the like, they make use of a kind of lathe, like that used by pewterers, to hold the vessels, which are to be wrought with proper tools: that of the engraver generally holds the tools, which are turned by a wheel; and the vessel is held to them to be cut and engraved, either in relievō or otherwise; the tools being moistened from time to time with diamond dust and oil, or at least emery and water. To engrave figures or devices on any of these stones, when polished, such as medals, seals, &c. they use a little iron wheel, the ends of whose axis are received within two pieces of iron, placed upright, as in the turner's lathe; and to be brought closer, or set farther apart, at pleasure: at one end of the axis are

fitted the proper tools, being kept tight by a screw. Lastly, The wheel is turned by the foot, and the stone applied by the hand to the tool, and is shifted and conducted as occasion requires.

The tools are generally of iron, and sometimes of brass; their form is various, but it generally bears some resemblance to chisels, gouges, &c. Some have small round heads, like buttons, others like ferrels, to take the pieces out, and others flat, &c. When the stone has been engraven, it is polished on wheels of hair-brushes and tripoli.

ENGRAVING on Steel is chiefly employed in cutting seals, punches, matrices, and dyes, proper for striking coins, medals, and counters. The method of engraving with the instruments, &c. is the same for coins as for medals and counters: All the difference consists in their greater or less relievō; the relievō of coins being much less considerable than that of medals, and that of counters still less than that of coins.

Engravers in steel commonly begin with punches, which are in relievō, and serve for making the creux or cavities of the matrices and dyes: though sometimes they begin with the creux or hollowness; but then it is only when the intended work is to be cut very shallow. The first thing done, is that of designing the figures; the next is the moulding them in wax, of the size and depth they are to lie, and from this wax the punch is engraven. When the punch is finished, they give it a very high temper, that it may the better bear the blows of the hammer with which it is struck to give the impressiō to the matrice.

The steel is made hot to soften it, that it may the more readily take the impressiō of the punch; and after striking the punch on it in this state, they proceed to touch up or finish the strokes and lines, where by reason of their fineness or the too great relievō they are any thing defective, with steel gravers of different kinds; chisels, flatters, &c. being the principal instruments used in graving on steel.

The figure being thus finished, they proceed to engrave the rest of the medal, as the mouldings of the border, the engrailed ring, letters, &c. with little steel punches, well tempered, and very sharp.

ENGUICHE', in *Heraldry*, is said of the great mouth of a hunting horn, when its rim is of a different colour from that of the horn itself.

ENHARMONIC, in *Music*. The Greeks had three different species of music; the *diatonic*, the *chromatic*, and the *enharmonic*. This last was esteemed by much the most agreeable and powerful of the three; but the difficulty of its execution rendered its duration short, and latter artists were upbraided for having sacrificed it to their indolence. It proceeded upon lesser intervals than either the diatonic or chromatic; and as the chromatic semitone is still less than the diatonic, the *enharmonic* intervals must have consisted of that semitone divided into parts more minute. In Rousseau's Musical Dictionary (at the word *Enharmonique*), the reader may see how that interval was found in the tetrachords of the ancients. It is by no means easy for modern ears, inured to intervals so widely different, to imagine how a piece of music, whose transitions were formed either chiefly or solely upon such minute divisions, could have such wonderful effects; yet the melody of speech, which rises or falls by intervals still

Engraving
||
Enharmonic.

Enhydrius
||
Ennius.

more minute than the enharmonic, when properly modulated and applied with taste, has an astonishing power over the soul. As to the modern enharmonic system, we may likewise refer the reader to the same work for an account of its nature and use; though he will find it accurately and clearly explained by D'Alembert in the Treatise of Music given in the present work, (art. 144. 145. 146.)

ENHYDRUS, in *Natural History*, a genus of siderochita or cruftated ferruginous bodies, formed in large and in great part empty cafes, incloſing a ſmall quantity of an aqueous fluid.

Of this genus there are only two ſpecies: 1. The thick-ſhelled enhydrius, with black, reddiſh-brown, and yellow cruſts. 2. The thinner-ſhelled kind, with yellowiſh-brown and purple cruſts; neither of which ferments with aquafortis or gives fire with ſteel.

ENIGMA. See *ÆNIGMA*.

ENIXUM, among chemiſts, a kind of natural ſalt, generated of an acid and an alkali.

The ſal enixum of Paracelſus, is the caput mortuum of ſpirits of nitre with oil of vitriol, or what remains in the retort after the diſtillation of this ſpirit; being of a white colour, and pleaſing acid taſte.

ENMANCHE', in *Heraldry*, is when lines are drawn from the centre of the upper edge of the chief to the ſides, to about half the breadth of the chief; ſignifying ſleeved, or reſembling a ſleeve, from the French *manche*.

ENNA, in *Ancient Geography*, a town of Sicily, ſituated on an eminence to the ſouth of the Chryſas; called the *centre of Sicily*. It was famous for a ſacred grove, in which the rape of Proſerpine happened; for a temple of Ceres, thence ſurnamed *Ennea*, and *Enneſſis*; and for fine ſprings, whence the name (Bochart.)

ENNEAGON, in *Geometry*, a polygon with nine ſides. See *POLYGON*.

ENNEAHEDRIA, in *Natural History*, a genus of columnar, cryſtalliform, and double-pointed ſpars, compoſed of a trigonal column, terminated at each end by a trigonal pyramid.

Of this genus there are ſeveral ſpecies, diſtinguiſhed by the length or ſhortneſs of the column and pyramids, none of which give fire with ſteel, but all of them ferment with aquafortis.

ENNEANDRIA, in *Botany*, (from *ennea*, nine, and *andros*, a man or husband), the name of the ninth claſs in Linnæus's ſexual ſyſtem, conſiſting of plants which have hermaphrodite flowers, with nine ſtamina or male organs. See *BOTANY Index*.

ENNIUS, QUINTUS, an ancient Latin poet, born at Rudii, a town in Calabria. He came firſt to Rome when M. Porcius Cato was queſtor, whom he had inſtructed in the Greek language in Sardinia; and by his genius and behaviour he gained the eſteem of the moſt eminent perſons in the city. According to Horace, Ennius never applied himſelf to writing till he had drank freely of wine. Hence he contracted the gout, of which he died nine years B. C. He was interred in Scipio's ſepulchre; who had a great eſteem and friendſhip for him, and cauſed a ſtatue to be erected to him upon his monument. He endeavoured to introduce the treaſures of the Greek tongue among the Latins, and was the firſt among the Romans who

made uſe of heroic verſes. He wrote the *Annals of Rome*; he tranſlated ſeveral tragedies from the Greek, and wrote others, beſide ſeveral comedies. We have only ſome fragments of his works, which were firſt collected by the two Stephens, and afterwards publiſhed at Naples, with a learned commentary, by Jerom Columna, in quarto, 1590; and reprinted at Amſterdam in 1707, in quarto, with additions by Heſſelius.

ENOCH, the ſon of Cain (Gen. iv. 17.), in honour of whom the firſt city taken notice of in Scripture was called *Enoch* by his father Cain, who built it. It was ſituated to the eaſt of the province of Eden.

ENOCH, the ſon of Jared and father of Methuſelah, was born in the year of the world 622. At the age of 65 he begat Methuſelah, and lived 300 years after, and had ſeveral ſons and daughter. Enoch walked with God; and after that he had lived in all 365 years, "he was not, for God took him." Some conſtrue theſe laſt words, as if they intimated that Enoch died a natural death, becauſe in reality he lived not near ſo long as the other patriarchs of thoſe times; as if God, to ſecure him from corruption, had been pleaſed to take him early out of this world. But the generality of the fathers and commentators aſſert that he died not, but was tranſlated out of the ſight of men, in like manner as Elijah was. The apoſtle Paul (Heb. xi. 5.) ſhows very clearly that Enoch was tranſlated, and did not ſee death.

The apoſtle Jude (ver. 14, 15.) cites a paſſage from the book of Enoch, which has very much exerciſed interpreters. The queſtion is, whether the apoſtle took this paſſage out of any particular book written by Enoch, which might be extant in the firſt ages of the church; whether he received it by tradition; or laſtly, by ſome particular revelation. It is thought probable, that he read it in the book we have been ſpeaking of, which, though apocryphal, might contain ſeveral truths that St Jude, who was favoured with a ſupernatural degree of underſtanding, might make uſe of to the edification of the faithful.

The ancients greatly eſteemed the prophecy of Enoch. Tertullian expreſſes his concern that it was not generally received in the world. That father, on the authority of this book, deduces the original of idolatry, aſtrology, and unlawful arts, from the revolted angels, who married with the daughters of men. St Auguſtin allows indeed that Enoch wrote ſomething divine, becauſe he is cited by St Jude; but he ſays it was not without reaſon that this book was not inſerted in the canon which was preſerved in the temple at Jeruſalem. This father ſufficiently inſinuates, that the authority of this book is doubtful, and that it cannot be proved that it was really written by Enoch. Indeed the account it gives of giants engendered by angels, and not by men, has manifeſtly the air of a fable, and the moſt judicious critics believe it ought not to be aſcribed to Enoch.

This apocryphal book lay a long time buried in darkneſs, till the learned Joſeph Scaliger recovered a part of it. Scaliger, Voſſius, and other learned men, attribute this work to one of thoſe Jews who lived between the time of the Babyloniſh captivity and that of Jeſus Chriſt. Others are of opinion, that it was written after the riſe and eſtabliſhment of Chriſtianity, by
one

Enormous
||
Ensemble.

one of those fanatics with whom the primitive church was filled, who made a ridiculous mixture of the Platonic philosophy and the Christian divinity.

The eastern people, who call Enoch by the name of *Edris*, believe that he received from God the gift of wisdom and knowledge; and that God sent him 30 volumes from heaven, filled with all the secrets of the most mysterious sciences. The Rabbins maintain, that when Enoch was translated to heaven, he was admitted into the number of the angels, and is the person generally known by the name of *Michael*.

ENORMOUS, something excessive or monstrous, especially in bulk.—The word is formed of the privative *e*, and *norma*, “rule;” q. d. “void of, or contrary to, rule or measure;” *contra normam*. In the corrupt ages of Latinity they used *innormis* and *inormis*.

In the French jurisprudence, *laeso enormis*, “enormous damage,” is that which exceeds half the value of the thing sold.

ENOS, the son of Seth and father of Cainan, was born in the year of the world 235. Moses tells us (Gen. iv. 26.), that then, “men began to call upon the name of the Lord;” or, as others translate it, that “Enos began to call upon the name of the Lord;” that is to say, that he was the inventor of religious rites and ceremonies in the external worship which was paid to God. This worship was kept up and preserved in Enos’s family, while Cain’s family was plunged in all manner of irregularities and impieties. Several Jews are of opinion, that idolatry was at first introduced into the world in the time of Enos. They translate the Hebrew thus, “Then men began to profane the name of the Lord.” Good men, to distinguish themselves from the wicked, began to take upon them the quality of sons or servants of God; for which reason, Moses (Gen. vi. 1, 2.) says that *the sons of God* (that is to say, the descendants of Enos, who had hitherto preserved the true religion), seeing the daughters of men, that they were fair, took them wives of all which they chose. Enos died at the age of 905 years, in the year of the world 1140.

ENS, among metaphysicians, denotes entity, being, or existence: thus the schools call *ens reale*, and *ens positivum*; to distinguish it from their *ens rationis*, which is only an imaginary thing, or exists but in the imagination.

ENS, among chemists, imports the power, virtue, and efficacy, which certain substances exert upon our bodies.

ENS, in *Geography*, a city of Germany, situated at the confluence of the Danube and the river Ens, about 80 miles south of Vienna. E. Long. 14. 20. N. Lat. 48. 16.

ENSATÆ, in *Botany*, (from *ensis*, “a sword”); the name of the sixth order in Linnæus’s natural method, consisting of plants with sword-shaped leaves. It contains the following genera, viz. Antholyza, Callisia, Commelina, Crocus, Eriocaulon, Ferraria, Gladiolus, Iris, Ixia, Moræa, Pontæderia, Sifyrinchium, Tradescantia, Wachendorffia, Xyris. See BOTANY *Index*.

ENSEELED, in *Falconry*, is said of a hawk that has a thread drawn through her upper eye-lid, and made fast under her beak, to take away the sight.

ENSEMBLE, a French term, sometimes used in

our language; literally signifying *together* or *one with another*:—being formed from the Latin *in* and *simul*.

In architecture, we say *the ensemble*, or *tout ensemble*, of a building; meaning the whole work, or composition, considered together, and not in parts; and sometimes also, the relative proportion of the parts to the whole.—“All those pieces of building make a fine *ensemble*.”

To judge well of a work, a statue, or other piece of sculpture, one must first examine whether the *ensemble* be good. The *tout ensemble* of a painting, is that harmony which results from the distribution of the several objects or figures whereof it is composed.—“This picture is good, taking the parts separately; but the *tout ensemble* is bad.”

ENSIFORMIS CARTILAGO. See XIPHOIDES.

ENSIGN, in the military art, a banner or colours under which soldiers are ranged, according to the different companies or parties they belong to. See FLAG, COLOURS, STANDARD, &c.

The Turkish ensigns are horses tails; those of the Europeans are pieces of taffety, with divers figures, colours, arms, and devices thereon. Xenophon tells us, that the ensign borne by the Persians was a golden eagle on a white flag; the Corinthians bore the winged horse, or Pegasus, in theirs; the Athenians, an owl; the Messenians, the Greek letter M; the Lacedæmonians the A. The Romans had a great diversity of ensigns; the wolf, minotaur, horse, boar, and at length the eagle, where they stopped: this was first assumed in the second year of the consulate of Marius*. A* See *Eagle's* military ensign on a medal of a Roman colony denotes it a colony peopled with old soldiers.

ENSIGN is also the officer that carries the colours, being the lowest commissioned officer in a company of foot, subordinate to the captain and lieutenant. It is a very honourable and proper post for a young gentleman at his first coming into the army: he is to carry the colours both in assault, day of battle, &c. and should not quit them but with his life: he is always to carry them himself on his left shoulder: only on a march he may have them carried by a soldier. If the ensign is killed, the captain is to carry the colours in his stead.

Naval ENSIGN, a large standard or banner hoisted on a long pole erected over the poop, and called the *ensign-staff*.—The ensign is used to distinguish the ships of different nations from each other, as also to characterize the different squadrons of the navy. The British ensign in ships of war is known by a double cross, viz. that of St George and St Andrew, formed upon a field which is either red, white, or blue.

ENSISHEIM, a town of France, in Upper Alsace. It is a pretty little place, well built, and consists of about 200 houses. E. Long. 7. 30. N. Lat. 47. 58.

ENT, SIR GEORGE, an eminent English physician, born at Sandwich in Kent in 1604. He was educated at Sidney college, Cambridge; and, afterwards travelling into foreign countries, received the degree of doctor of physic at Padua. After his return he obtained great practice, was made president of the college of physicians in London, and at length received the honour of knighthood from King Charles II. He was extremely intimate with Doctor Harvey; whom he

Entablature
||
Entomology.

he learnedly defended, in a piece entitled *Apologia pro Circulatione Sanguinis, contra Æmilium Parisanum*. He also published, *Animadversiones in Malachie Throni*; and some observations in the Philosophical Transactions. Glanville, speaking of his *Plus Ultra* of the modern improvements in anatomy, numbers Sir George Ent, Doctor Glisson, and Doctor Wallis, with the most celebrated discoverers in that science. The two former were among the first members of the Royal Society. Sir George Ent died in October 1689.

ENTABLATURE, or ENTABLEMENT, in *Architecture*, is that part of an order of a column which is over the capital, and comprehends the architrave, frieze, and cornice. See ARCHITECTURE, chap. i.

ENTABLER, in the manege, the fault of a horse whose croupe goes before his shoulders in working upon volts; which may be prevented by taking hold of the right rein, keeping your right leg near, and removing your left leg as far from the horse's shoulder as possible.

This is always accompanied with another fault called *aculer*. See ACULER.

ENTAIL, in *Law*, signifies *feetail*, or *fee entailed*; that is, abridged, curtailed, or limited, to certain conditions. See FEE and TAIL.

ENTE', in *Heraldry*, a method of marshalling, more frequent abroad than with us, and signifying grafted or ingrafted.

We have indeed, one instance of enté in the fourth grand quarter of his majesty's royal ensign, whose blazon is Brunswick and Lunenburg impaled with ancient Saxony, *enté en pointe*, "grafted in point."

ENTEROCELE, in *Surgery*, a tumor formed by a prolapsion of the intestines through the rings of the abdomen and processes of the peritonæum, into the scrotum. See SURGERY *Index*.

ENTHUSIASM, an ecstasy of the mind, whereby it is led to think and imagine things in a sublime, surprising, yet probable manner. This is the enthusiasm felt in poetry, oratory, music, painting, sculpture, &c.

ENTHUSIASM, in a religious sense, implies a transport of the mind, whereby it fancies itself inspired with some revelation, impulse, &c. from heaven. Mr Locke gives the following description of enthusiasm. "In all ages, men in whom melancholy has mixed with devotion, or whose conceit of themselves has raised them into an opinion of a great familiarity with God, and a nearer admittance to his favour than is afforded to others, have often flattered themselves with a persuasion

of an immediate intercourse with the Deity, and frequent communications from the Divine Spirit. Their minds being thus prepared, whatever groundless opinion comes to settle itself strongly upon their fancies, is an illumination from the Spirit of God. And whatsoever odd action they find in themselves a strong inclination to do, that impulse is concluded to be a call or direction from heaven, and must be obeyed. It is a commission from above, and they cannot err in executing it. This I take to be properly enthusiasm, which, though arising from the conceit of a warm and overweening brain, works, when it once gets footing, more powerfully on the persuasions and actions of men, than either reason or revelation, or both together; men being most forwardly obedient to the impulses they receive from themselves." Devotion, when it does not lie under the check of reason, is apt to degenerate into enthusiasm. When the mind finds itself inflamed with devotion, it is apt to think that it is not of its own kindling, but blown up with something divine within it. If the mind indulges this thought too far, and humours the growing passion, it at last flings itself into imaginary raptures and ecstasies; and when once it fancies itself under the influence of a divine impulse, no wonder if it slight human ordinances, and refuses to comply with the established form of religion, as thinking itself directed by a much superior guide.

ENTHUSIAST, a person possessed with enthusiasm. See the preceding article.

ENTHYMEME, in *Logic* and *Rhetoric*, an argument consisting only of two propositions, an antecedent, and a consequent deduced from it. The word is Greek, *ενθυμημα*, formed of the verb *ενθυμεισθαι*, "to think, conceive," a compound of *εν* and *θυμος*, "mind."

The enthymeme is the most simple and elegant of all argumentations; being what a man, in arguing closely, commonly makes, without attending at all to the form. Thus, that verse remaining of Ovid's tragedy, entitled *Medea*, contains an enthymeme; *Servare potui, perdere an possim rogas*: "I was able to save you; consequently to have destroyed you." All the beauty would have been lost, had all the propositions been expressed; the mind is displeased with a rehearsal of what is nowise necessary.

Sometimes, also, the two propositions of an enthymeme are both included in a single proposition, which Aristotle calls an *enthymematical sentence*, and gives this instance thereof: *Mortal, do not bear an immortal hatred. The whole enthymeme would be, Thou art mortal; let not, therefore, thy hatred be immortal.*

ENTITY, the same with ENS.

E N T O M O L O G Y .

ENTOMOLOGY, (from *εντομος*, "an insect", and *λογος*, "a discourse,") is that part of zoology which treats of insects.

Many are disposed to reckon the study of Entomology trifling. Hunters of butterflies, and catchers of grasshoppers, are laughed at by the vulgar, and even by those who are more enlightened. The great numbers and diversity of insects, the beauty and configuration of

some of them, and the singular instincts of others, cannot but attract notice, and excite astonishment in those who are fond of contemplating the works of nature, rendering thus the study of Entomology, to them, a source of much pleasure. A collection of the individuals which compose any of the more numerous genera, placed at the same time, before one capable of attending to the striking similarity of the whole, and tracing

Enthusiast
||
Entomology.

the distinguishing peculiarities of each, cannot fail to create surprise. The great and almost phantastic variety of their forms, the nice adaptation of their parts to the situation in which each happens to be placed, must appear truly wonderful. In every department of nature, which comes within the reach of the human mind, a pleasing and luxuriant variety is discernible. The same supreme Intelligence, which, by varying the position of the planetary orbs with respect to the sun, and by other seemingly simple but beautiful contrivances, hath produced their different length of day and year, and alternation of seasons, is manifest in the formation of the minutest insect. Each has received that mechanism of body, those peculiar instincts, and is made to undergo those different changes, which fit it for its destined situation, and enable it to perform its proper functions. The utility of many insects, such as the bee, the crab, the silk-worm, the cochineal insect, &c. renders them both interesting and important; and a more intimate acquaintance with the class, may enable us to add to the number of those that are useful to man, and to improvements in the management of those already known. The havoc many insects make in the vegetable kingdom, the vexation, diseases, and destruction they occasion among animals, should induce those who are engaged in agriculture, and in the rearing and management of animals, to pay attention to Entomology; for the better they are acquainted with their enemies, the abler they must be to attack them with advantage.

Most insects undergo three very distinct changes: which circumstance, joined to the very great difference of appearance which is often met with in the male and female, and even in the neuters of some species, renders their number apparently greater than it really is, and adds considerably to the difficulty of reducing them to order.

Different naturalists have attempted to arrange them into families and genera, particularly the celebrated LINNÆUS, whose arrangement is followed here. He has formed them into seven families or orders, composing his sixth class of animals, INSECTA. He defines an insect, a small animal, breathing through pores on its sides, furnished with moveable *antennæ* and many feet, covered with either a hard crust, or a hairy skin. Before the distinguishing marks of the orders and genera can be understood, it will be necessary to enumerate and explain the terms he has given to the different parts, and the most remarkable of the epithets he has applied to them.

The body is divided into *Head*, *Trunk*, *Abdomen*, and *Extremities*.

Head, &c. I. CAPUT, the *Head*, which is distinguishable in most insects, is furnished with *Eyes*, *Antennæ*, and most frequently with a *Mouth*.

The *EYES*, 2, 4, 6, or 8 in number, destitute of eye-lids, are either small and simple; or large, compound and hemispherical; or polyedral. They are commonly immoveable. They are called *stipitati* when placed on a stalk.

The *ANTENNÆ* are two articulated moveable processes, placed on the head.

They are either, 1. *Setaceæ*, setaceous, i. e. like a bristle, when they taper gradually from their base, or insertion into the head, to their point.

2. *Clavataæ*, clavated, i. e. club-shaped, when they grow gradually thicker from their base to their point.

3. *Filiformes*, filiform, i. e. thread-shaped, when they are of an equal thickness throughout the whole of their length.

4. *Moniliformes*, moniliform, i. e. of the form of a necklace, when they are of an equal thickness throughout, but formed of a series of knobs, resembling a string of beads.

5. *Capitataæ*, capitate, i. e. with a head or knob, when they grow thicker towards the point, and terminate in a knob or head.

6. *Fiffiles*, fiffile, i. e. cleft, when they are capitate, and have the head or knob divided longitudinally into three or four parts or laminae.

7. *Perfoliataæ*, perfoliated, when the head or knob is divided horizontally.

8. *Pectinataæ*, pectinated, i. e. resembling a comb, when they have a longitudinal series of hairs projecting from them, in form of a comb.

9. *Barbataæ*, barbed, when they have little projections or barbs placed on their sides. They are either, 1. *Longiores*, longer than the body; 2. *Breviores* shorter than the body; or, 3. *Mediocrates*, of the same length with the body.

The *MOUTH*, in most insects, is placed in the under part of the head; sometimes however, it is situated in the thorax, and in a few instances, is entirely wanting. It is furnished with, 1. *Palpæ*, or feelers; 2. *Rostrum*, i. e. beak or snout; 3. *Labium*, or lip; 4. *Maxille*, or jaws, placed transversely, and moving laterally; 5. *Dentes*, or teeth; 6. *Lingua*, or tongue; 7. *Palatum*, or palate.

Palpæ, feelers, which are 4 or 6 in number, are attached to the mouth, and have 2, 4, or 3 articulations.

The *Stemmata* are three prominent shining points on the top of the head.

II. TRUNCUS, the *Trunk*, to which the legs are Trunk. attached, is situated between the head and the abdomen. It is divided into, 1. the *Thorax*, or chest, which is the superior part; 2. *Scutellum*, i. e. small shield or escutcheon, which is the posterior part; 3. the *Breast* and *Sternum*, which is the inferior part.

III. The *ABDOMEN*, that part which contains Abdomen. the stomach, intestines, and other viscera, consists of several annular segments. It is perforated on the sides with *spiracula*, i. e. breathing-holes. The upper part of it is termed *Tergum*, or back; the inferior part *Venter*, or belly; the posterior part *Anus*.

IV. ARTUS, the extremities, are, 1. the *Wings*; Extremities. 2. *Legs*; 3. *Tail*.

I. *ALÆ*, the wings, are two, or four. They are either,

1. *Planæ*, i. e. plain, such as cannot be folded up by the insect.

2. *Plicatiles*, or folding, such as can be folded up by the insect at pleasure.

3. *Erectæ*, erect, such as have their superior surfaces brought into contact, and stand upright when the insect is at rest.

4. *Patentes*, spreading; such as are extended horizontally.

5. *Incumbentes*, incumbent; such as rest on the upper part of the abdomen.

6. *Deflexæ*, bent down; such as are partly incumbent,

bent, but have their exterior edge inclined towards the sides of the abdomen.

7. *Reversa*, reverfed; fuch as are incumbent, but inverted.

8. *Dentata*, fuch as have their edges notched or ferrated.

9. *Caudata*, fuch as have procefles extended from their extremitres like a tail.

10. *Reticulata*, netted; when the veffels of the wings put on the appearance of net-work.

11. *Picta*, painted; fuch as are marked with coloured fpoths, bands, ftreaks, lines or dots.

12. *Notata*, marked with fpecks.

13. *Ornata*, adorned with little eyes, or circular fpoths, containing a fpot of a different colour in their centre. The central fpot is termed *pupil*; the exterior one is called *iris*. This may happen either in the primary or fecondary wings, on their upper or under fufaces. The fuperior wing is called *primary*, and the inferior *fecondary*, to avoid confufion, as they may be at times reverfed.

Elytra.

The ELYTRA are hard fhells, occupying the place of the upper wings. They are, for the moft part moveable, and are either,

1. *Truncata*, truncated, when fhorter than the abdomen, and terminated by a tranfverfe line.

2. *Spinofa*, or prickly, when their fufaces are covered with fharp points or prickles.

3. *Serrata*, ferrated, when their edges are notched.

4. *Scabra*, rough, when their furface refembles a file.

5. *Striata*, ftriated, when marked with fender longitudinal furrows.

6. *Porcata*, ridged, when marked with elevated ridges.

7. *Sulcata*, furrowed.

8. *Punctata*, marked with dots.

9. *Fafigiata*, when formed like the roof of a houfe.

Hemelytra.

The HEMELYTRA, as it were half-elytra, partaking partly of the nature of cruftaceous fhells, and membranaceous wings; being formed of an intermediate fubftance.

Halteres.

HALTERES, or poifers, are fmall orbicular bodies placed on ftalks, fituated under the wings of infects, of the order *Diptera*.

II. PEDES, the *Legs*. They are divided into, 1. *Femur*, or thigh, that part which is joined to the trunk; 2. *Tibia*, or fhank; 3. *Tarfus*, or foot; 4. *Ungues*, hooks or nails; 5. *Manus*, (chela), hands or claws, fimple, with a moveable thumb, as in the crab.

The hind-legs are termed, 1. *Curforii*, formed for running; 2. *Salvatorii*, formed for leaping; 3. *Natatorii*, formed for fwimming.

III. CAUDA, the *Tail*, which terminates the abdomen, is, 1. *Solitaria*, i. e. fingle. 2. *Bicornis*, i. e. two-horned or double. 3. *Simplex*, fimple, i. e. unarmed. 4. *Armata*, i. e. furnifhed, 1. with *Forceps* or *Pincers*; 2. with *Furca*, a fork; 3. with one or more *Setæ* or briftles; 4. with an *Aculeus*, or fting, either fmooth or barbed. A fting is a weapon, frequently hollow, with which fome infects are furnifhed, through which they difcharge a poifon into the wound they inflict.

Sexes

The SEXES of infects are commonly two, *male* and *female*. *Neuters* are to be met with among thofe infects which live in fwarms, fuch as ants, bees, &c.

Moft infects undergo three changes. An infect is at firft hatched from a very fmall egg, and becomes a LARVA; a foft fucculent animal, without wings, incapable of producing its fpecies, flow in its motions, fometimes without feet, but more frequently with them; confuming greedily the kind of food which is peculiar to it, and which, in proper time, is changed into a PUPA.

PUPA (*Nympha*, *Chryfalis*), is firmer and drier than the larva, and is confined either by a naked membrane, or enclosed in a follicle. It is commonly without a mouth; fometimes it has feet, but more frequently none.

1. *Completa*, complete in all their parts, and active; as the aranea, acarus, onifcus, &c.

2. *Semicompleta*, half complete, with only the rudiments of wings; as the grylius, cicada, cimex, libellula, and ephemera.

3. *Incompleta*, incomplete, with immoveable wings and feet; as the apis, formica, and tipula.

4. *Obtefta*, covered, having the thorax and abdomen enclosed in a fkin, and that either naked, or enclosed in a follicle differently compofed.

5. *Coarctata*, confined within a globe; as the mufca, œftrus.

The pupa is converted into the *imago*, or the perfect infect.

IMAGO, is the perfect infect, active, furnifhed with antennæ, and capable of generating.

Infects are faid to inhabit thofe plants on which they feed, and not thofe on which they may be occasionally found, and receive from them many of their fpecific names.

LINNÆUS has divided the clafs of infects into feven orders.

I. COLEOPTERA, (from *κολοπος*, "a fheath," and *πτερον*, "a wing"), are fuch infects as have four wings, the upper pair of which are elytra, or cruftaceous fhells, which, when the animal is at reft, fhut, and form a ftraight future down the back.

II. HEMIPTERA, (from *εμεις* "half," and *πτερον*, "a wing"), containing fuch infects as have four wings, the fuperior pair being half cruftaceous, and incumbent, and a mouth or beak bent toward the breaft.

III. LEPIDOPTERA, (from *λεπος* "a fcale," and *πτερον*, "a wing," containing fuch infects as have four wings covered with minute imbricated fcales, a hairy body, and a mouth furnifhed with an involuted fpiral tongue.

IV. NEUROPTERA, (from *νευρον*, "a nerve," and *πτερον*, "a wing"), containing fuch infects as have four naked wings, marked with veins croffing one another like net-work; the tail unarmed.

V. HYMENOPTERA, (from *υμην*, "a membrane," and *πτερον*, "a wing"), containing fuch infects as have four membranaceous wings, and a tail furnifhed with a fting.

VI. DIPTERA, (from *δω*, "two," and *πτερον*, "a wing"), fuch as have two wings and poifers.

VII. APTERA, (from *α*, "without," and *πτερον*, "a wing"), fuch as have no wings or elytra in either fex.

CHARACTERS OF INSECTS.

Coleoptera.

I. COLEOPTERA.

The insects belonging to this order are formed into four subdivisions. 1. Those that have the antennæ clavated, and thickened towards their exterior side. 2. Those that have the antennæ moniliform. 3. Those which have the antennæ filiform. 4. Those which have the antennæ fetaceous.

A. *Antennis clavatis, extrorsum incrassatis.*a. *Clava lamellata.*

1. SCARABÆUS. Tibiæ anteriores dentatæ.
2. LUCANUS. Penicilli duo sub labio, palpigeri.

b. *Clava perfoliata.*

3. DERMESTES. Caput inflexum sub thorace, vix marginato.
4. MELYRIS. Labium clavatum, emarginatum.
5. BYRRHUS. Labium porrectum, bifidum.
6. SYLPHA. Thorax et elytra marginata.
7. TRITOMA. Palpi anteriores securiformes.
8. HYDROPHILUS. Maxilla bifida.

c. *Clava solida.*

9. HISTER. Caput retractile intra thoracem.
10. PAUSUS. Antennæ biarticulatæ. Clava uncinata.
11. BOSTRICHUS. Caput inflexum sub thorace, vix marginato.
12. ANTHRENUS. Maxilla bifida.
13. NITIDULA. Thorax et elytra marginata.
14. COCCINELLA. Palpi anteriores securiformes; posteriores filiformes.
15. CURCULIO. Rostrum elongatum corneum.

B. *Antennis moniliformibus.*

16. BRENTUS. Rostrum elongatum, corneum, rectum.
17. ATTELABUS. Rostrum elongatum, incurvum.
18. ERODIUS. Labium corneum, emarginatum.
19. STAPHYLINUS. Elytra dimidiata, alas tegentia. Vesciculæ duæ supra caudam exferendæ.
20. SCAURUS. Labium truncatum integrum.
21. ZYGIA. Labium elongatum, membranaceum.
22. MELOE. Thorax subrotundus. Caput gibbum, inflexum.
23. TENEBRIO. Thorax marginatus. Caput exsertum. Corpus oblongum.
24. CASSIDA. Corpus ovatum. Elytra marginata. Caput tectum clypeo.
25. OPATRUM. Thorax et elytra marginata.
26. MORDELLA. Laminæ ad basin abdominis. Caput inflexum.
27. CHRYSOMELA. Corpus ovatum, immarginatum.
28. HORIA. Palpi inæquales. Maxilla bifida. Labium rotundatum.

A. *The Antennæ clavated, becoming thicker towards their exterior side.*a. *The Clava or Club lamellated.*

- S. The fanks of the fore-legs dentated.
- L. Two tufts under the lip, to which the feelers are attached.

b. *The Club perfoliated.*

- D. The head bent under the thorax, which is scarcely marginated.
- M. The lip clavated and emarginated.
- B. The lip stretched out, and bifid.
- S. The thorax and elytra marginated.
- T. The two anterior feelers hatchet-shaped.
- H. The jaw bifid.

c. *The Club solid.*

- H. The head capable of being drawn back within the thorax.
- P. The antennæ consisting of two articulations. The club hooked.
- B. The head bent under the thorax, which is slightly marginated.
- A. The jaw bifid.
- N. The thorax and elytra marginated.
- C. The anterior feelers hatchet-shaped; the posterior filiform.
- C. The beak, lengthened and horny.

B. *With the Antennæ moniliform.*

- B. The beak elongated, horny and straight.
- A. The beak elongated and crooked.
- E. The lip horny and emarginated.
- S. The elytra half the length of the body, covering the wings. Two vesicles above the tail, which can be pushed out at pleasure.
- S. The lip truncated, and entire.
- Z. The lip elongated and membranaceous.
- M. The thorax roundish. The head gibbous, and bent inwards.
- T. The thorax marginated. The head stretched out. The body oblong.
- C. The body oblong. The elytra marginated. The head covered with a shield.
- O. The thorax and elytra marginated.
- M. Laminæ at the base of the abdomen. Head inflected.
- C. The body oval, immarginated.
- H. Feelers unequal. Jaw bifid. Lip rounded.

C. *Antennæ*

C. *Antennis filiformibus.*

29. APALUS. Thorax subrotundus. Caput gibbum, inflexum.
 30. MANTICORA. Maxillæ exsertæ, dentatæ. Oculi prominuli.
 31. PIMELIA. Thorax marginatus. Caput exsertum. Corpus oblongum.
 32. GYRINUS. Antennæ rigidulæ. Oculi quatuor.
 33. CUCUJUS. Labium breve, bifidum, laciniis distantibus.
 34. CRYPTOCEPHALUS. Corpus ovatum immarginatum.
 35. BRUCHUS. Antennæ extrorsum crassiores.
 36. PTINUS. Thorax caput recipiens. Antennæ articulis ultimis longioribus.
 37. HISPA. Antennæ porrectæ, approximatae, fusiformes.
 38. BUPRESTIS. Caput dimidium, intra thoracem retractum.
 39. NECYDALIS. Elytra dimidiata, alis nudis.
 40. LAMPYRIS. Elytra flexilia. Thoracis clypeus caput obumbrans recipiensque.
 41. CANTHARIS. Elytra flexilia. Abdomen lateribus plicato-papillosum.
 42. NOTOXUS. Labium bifidum; laciniis conniventibus obtusis.
 43. ELATER. Pectoris mucro è poro abdominis resiliens.
 44. CALOPUS. Thorax ad latera mucronato-callosum.
 45. ALURNUS. Maxilla fornicata.
 46. CARABUS. Thorax obcordatus, posterius truncatus.
 47. LYTTA. Thorax subrotundus. Caput gibbum inflexum.

D. *Antennis setaceis.*

48. SERROPALPUS. Palpi anteriores profundè ferrati.
 49. CERAMBYX. Thorax ad latera mucronato-callosum.
 50. LEPTURA. Elytra apice attenuata. Thorax teretiufculus.
 51. RHINOMACER. Antennæ rostro infidentes.
 52. ZONITIS. Labium emarginatum.
 53. CICINDELA. Maxillæ exsertæ, dentatæ. Oculi prominuli.
 54. DYTISCUS. Pedes posteriores ciliati, natatorii.
 55. FORFICULA. Elytra dimidiata. Alis teetis. Cauda forcipata.

II. HEMIPTERA.

Hemiptera.

56. BLATTA. Os maxillosum. Alæ coriaceæ, planæ. Pedes cursorii.
 57. PNEUMORA. Os maxillosum. Alæ membranaceæ, deflexæ. Pedes cursorii. Corpus cavum, inflatum, diaphanum.
 58. MANTIS. Os maxillosum. Pedes anteriores ferrati, ungue unico.
 59. GRYLLUS. Os maxillosum. Pedes posteriores saltatorii.

C. *Antennæ filiform.*

- A. Thorax roundish. Head turgid, inflected.
 M. Jaws stretched out, furnished with teeth. Eyes rather prominent.
 P. Thorax margined. Head stretched out. Body oblong.
 G. Antennæ a little rigid. Eyes 4.
 C. Lip short, bifid, the divisions distant.
 C. Body oval, immarginated.
 B. Antennæ growing thicker towards the external edge.
 P. Thorax receiving the head: last joints of the antennæ longer than the rest.
 H. Antennæ stretched forwards, approaching one another, and spindle-shaped.
 B. Head half retracted within the thorax.
 N. Elytra half the length of the body. Wings naked.
 L. Elytra flexible. Shield of the thorax shading and receiving the head.
 C. Elytra flexible. Sides of the abdomen edged with folded papillæ.
 N. Lip bifid; the divisions of it obtuse and approaching closely.
 E. A sharp point proceeding from the breast, springing out at a pore in the abdomen.
 C. The thorax callous at the sides, and set with sharp points.
 A. Jaw arched. Feelers 6.
 C. The thorax resembling a heart inverted, and terminating abruptly behind.
 L. Thorax roundish. Head turgid, inflected.

D. *Antennæ setaceous.*

- S. The anterior feelers deeply ferrated.
 C. The thorax callous at the sides, and set with sharp points.
 L. Elytra tapering towards the tip. Thorax roundish.
 R. Antennæ seated on the snout.
 Z. Lip emarginated.
 C. Jaws stretched out, furnished with teeth. Eyes a little prominent.
 D. Hind-legs fringed, formed for swimming.
 F. Elytra half as long as the body. Wings covered. Tail furnished with pincers.

II. HEMIPTERA.

- B. Mouth furnished with jaws. Wings coriaceous, plane. Legs formed for running.
 P. Mouth furnished with jaws. Wings membranaceous, deflected. Legs formed for running. Body hollow, inflated, and transparent.
 M. Mouth furnished with jaws. The anterior legs ferrated, and terminated by a single claw.
 G. Mouth furnished with jaws. Hind-legs formed for leaping.

60. *FULGORA*. Rostrum inflexum. Frons producta, inermis. Antennæ capitatae.

61. *CICADA*. Rostrum inflexum. Pedes posteriores saltatorii.

62. *NOTONECTA*. Rostrum inflexum. Pedes posteriores natatorii (ciliati).

63. *NEPA*. Rostrum inflexum. Pedes anteriores cheliferi.

64. *CIMEX*. Rostrum inflexum. Pedes cursorii. Antennæ thorace longiores.

65. *MACROCEPHALUS*. Rostrum inflexum. Antennæ brevissimæ.

66. *APHIS*. Rostrum inflexum. Abdomen bicornè.

67. *CHERMES*. Rostrum pectorale. Pedes posteriores saltatorii.

68. *COCCUS*. Rostrum pectorale. Abdomen (maribus) posterius setosum.

69. *THRIPS*. Rostrum obsoletum. Alæ incumbentes, abdomine reflexile.

F. Snout inflected. Fore-head projecting, unarmed. Antennæ capitated.

C. Snout inflected. Hind-legs formed for leaping.

N. Snout inflected. Hind-legs fringed and formed for swimming.

N. Snout inflected. Fore-legs furnished with claws.

C. Snout inflected. Legs formed for running. Antennæ longer than the thorax.

M. Snout inflected. Antennæ very short.

A. Snout inflected. Abdomen 2-horned.

C. Snout placed in the breast. Hind-legs formed for leaping.

C. Snout placed in the breast. Abdomen (in the males) terminating in bristles.

T. Snout obsolete. Wings incumbent. The abdomen capable of being turned up.

Lepidoptera.

III. LEPIDOPTERA.

70. *PAPILIO*. Antennæ extrosum crassiores. Alæ erectæ.

71. *SPHINX*. Antennæ medio crassiores.

72. *PHALENA*. Antennæ introrsum crassiores.

P. Antennæ thicker towards the point. Wings erect.

S. Antennæ thicker in the middle.

P. Antennæ thicker towards the base.

Neuroptera.

IV. NEUROPTERA.

73. *LIBELLULA*. Cauda forcipata. Os multi maxillosum. Alæ extensæ.

74. *EPHEMERA*. Cauda setis 2 et 3. Os edentulum. Alæ erectæ.

75. *MYRMELEON*. Cauda forcipata. Os bidentatum. Alæ deflexæ.

76. *PHRYGANEÆ*. Cauda simplex. Os edentulum. Alæ deflexæ.

77. *HEMEROBIUS*. Cauda simplex. Os bidentatum. Alæ deflexæ.

78. *PANORPA*. Cauda chelata. Os rostratum. Alæ incumbentes.

79. *RAPHIDIA*. Cauda filo 1. Os bidentatum. Alæ deflexæ.

L. Tail forked. Mouth with many jaws. Wings expanded.

E. Tail with 2 and 3 bristles. Mouth without teeth. Wings erect.

M. Tail forked. Mouth with two teeth. Wings deflected.

P. Tail simple. Mouth without teeth. Wings deflected.

H. Tail simple. Mouth with two teeth. Wings deflected.

P. Tail furnished with a claw. Mouth stretched out into a beak. Wings incumbent.

R. Tail ending in a simple thread. Mouth with two teeth. Wings deflected.

Hymenoptera.

V. HYMENOPTERA.

80. *CYNIPS*. Aculeus spiralis!

81. *TENTHREDO*. Aculeus ferratus! bivalvis.

82. *SIREX*. Aculeus ferratus, sub abdominis spina terminali.

83. *ICHNEUMON*. Aculeus exsertus! triplex.

84. *SPHEX*. Aculeus punctorius. Alæ planæ. Lingua inflexa, trifida.

85. *SCOLIA*. Lingua inflexa, trifida. Labium apice membranaceum.

86. *THYNNUS*. Lingua brevissima, involuta. Labium trifidum.

87. *LEUCOPSIS*. Labium maxilla longius, emarginatum. Antennæ clavatae.

88. *TIPHIA*. Labium breve, corneum, tridentatum.

89. *CHALCIS*. Antennæ breves, cylindricæ, fusiformes.

90. *CHRYSIS*. Aculeus punctorius. Abdomen subtus fornicatum.

C. Sting spiral.

T. Sting ferrated, two-valved.

S. Sting ferrated, under a spine which terminates the abdomen.

I. Sting stretched out, triple.

S. Sting pungent. Wings smooth. Tongue inflected, and divided into three at the extremity.

S. Tongue inflected, trifid. Lip membranaceous at the extremity.

T. Tongue very short, involuted. Lip trifid.

L. Lip longer than the jaw, notched. Antennæ clavated.

T. Lip short, horny, with three small divisions.

C. Antennæ short, cylindrical, spindle-shaped.

C. Sting pungent. Abdomen arched beneath.

91. VESPA. Aculeus punctorius. Alæ superiores plicatæ!
 92. APIS. Aculeus punctorius. Lingua inflexa!
 93. FORMICA. Aculeus obsoletus. Alæ neutris nullæ!
 94. MUTILLA. Aculeus punctorius. Alæ neutris nullæ.

- V. Sting pungent. Upper wings folded.
 A. Sting pungent. Tongue inflected.
 F. Sting obsolete. Neuters without wings.
 M. Sting pungent. Neuters without wings.

Diptera.

VI. DIPTERA.

A. *Proboscide et Haustello.*

95. DIOPSIS. Caput bicornè. Oculis terminalibus.
 96. TIPULA. Haustellum sine vagina. Palpi 2, porrecti, filiformes.
 97. MUSCA. Haustellum sine vagina, fetis instructum.
 98. TABANUS. Haustellum vagina univalvi, fetisque instructum.
 99. EMPIS. Proboscis inflexa.
 100. CONOPS. Proboscis porrecta, geniculata.

B. *Haustello sine Proboscide.*

101. OESTRUS. Haustellum retractum intra labia, connata poro pertusa.
 102. ASILUS. Haustellum rectum bivalve, basi gibbum.
 103. STOMOXYS. Haustellum vagina univalve convoluta, basi geniculata.
 104. CULEX. Vagina exserta, univalvis, flexilis, fetis 5.
 105. BOMBYLIUS. Haustellum longissimum, rectum, fetaceum, bivalve.
 106. HIPPOBOSCA. Haustellum brevè, cylindricum, rectum, bivalve.

Aptera.

VII. APTERA.

A. *Pedibus sex, Capite à Thorace discreto.*

107. LEPISMA. Cauda fetis exsertis.
 108. PODURA. Cauda bifurca, inflexa, saltatrix.
 109. TERMES. Os maxillis duabus. Labium corneum, quadrifidum.
 110. PEDICULUS. Os aculeo exferendo.
 111. PULEX. Os rostro inflexo, cum aculeo. Pedes saltatorii.

B. *Pedibus 8—14. Capite Thoraceque unitis.*

112. ACARUS. Oculi 2. Pedes 8. Palpi compressi.
 113. HYDRACHNA. Oculi 2—8. Pedes 8, in anteriore corporis parte. Papillæ textoriæ.
 114. ARANEA. Oculi 8. Pedes 8. Papillæ textoriæ. Palpi clavati.
 115. PHALANGIUM. Oculi 4. Pedes 8. Palpi chelati.
 116. SCORPIO. Oculi 8. Pedes 8. Palpi chelati.
 117. CANCER. Oculi 2. Pedes 10, primo chelato.

VI. DIPTERA.

A. *With Proboscis and Sucker.*

- D. Head two-horned. Eyes terminal.
 T. Sucker without a sheath. Feelers 2, projecting, filiform.
 M. Sucker without a sheath, furnished with bristles.
 T. Sucker with a single-valved sheath, furnished with bristles.
 E. Proboscis inflected.
 C. Proboscis projecting, and bent with an angular flexure.

B. *With Sucker, but no Proboscis.*

- O. Sucker drawn back within the lips, which are perforated.
 A. Sucker straight, with two valves, turgid at the base.
 S. Sucker with a single-valved convoluted sheath, bent at the base, with an angular flexure.
 C. Sheath stretched out, of one flexible valve, with 5 bristles.
 B. Sucker very long, straight, fetaceous, with two valves.
 H. Sucker short, cylindrical, straight, with two valves.

VII. APTERA.

A. *Legs six. Head distinct from the Thorax.*

- L. Tail ending in fetaceous bristles.
 P. Tail forked, inflected, elastic.
 T. Mouth with two jaws. Lip horny, cleft into four pieces.
 P. Mouth armed with a sting capable of being pushed out at pleasure.
 P. Snout inflected, armed with a sting. Feet formed for leaping.

B. *Legs 8—14. Head and Thorax united.*

- A. Eyes 2. Legs 8. Feelers compressed.
 H. Eyes 2—8. Legs 8. Abdomen furnished with papillæ, with which the animal spins thread and weaves itself a web.
 A. Eyes 8. Legs 8. Abdomen furnished with papillæ, with which the animal spins thread and weaves itself a web.
 P. Eyes 4. Legs 8. Feelers furnished with claws.
 S. Eyes 8. Legs 8. Feelers furnished with claws.
 C. Eyes 2. Legs 10, the first pair furnished with claws.

118. MONOCULUS. Oculi 2. Pedes 12, decem chelatis.

119. ONISCUS. Oculi 2. Pedes 14.

C. *Pedibus pluribus. Capite à Thorace discreto.*

120. SCOLOPENDRA. Corpus lineare.

121. JULUS. Corpus subcylindricum.

M. Eyes 2. Legs 12, 10 of them furnished with claws.

O. Eyes 2. Legs 14.

C. *Legs numerous. Head distinct from the Thorax.*

S. Body linear.

J. Body nearly cylindrical.

N. B.—In the following classification, some of the more remarkable species only are enumerated. Those marked with an asterisk are natives of Britain.

I. COLEOPTERA.

Elytra covering the wings.

Scarabæus.

1. SCARABÆUS, Beetle.

Antennæ clavated, the club lamellated. Feelers 4. Jaws horny, for the most part without teeth. The shanks of the fore-legs generally dentated.

The larvæ of the genus *scarabæus* have six feet, and a body composed of annular segments, furnished with hairs, and with vesicles at the end of the abdomen. Their heads are hard, formed of a substance like horn. They are commonly called *grubs*, and do much mischief, both in the fields and in the garden. They live chiefly under ground, or in dung, on which they frequently feed. The larvæ of the species *cetonia* live on rotten wood, and those of the *melolontha* on the roots of plants. The *pupa* remains under ground.—Grubs are devoured by many kinds of birds, particularly by the rooks, which, on that account ought not to be destroyed so eagerly as they are in many places; for, though they do much mischief themselves, in spring, and during harvest, yet it is amply compensated by the good they do through the year, in clearing the ground of grubs.

* *Feelers filiform.*

† *Jaw arched.*

a. *Without teeth.*

N. *Thorax horned.*

α. *Scutellati.*

* *hercules.* A horn on the thorax, large, and bent inwards, barbed below with one tooth; a horn on the head bent back, dentated on the upper side with many teeth. *Syst. Nat. Lin.* 1. It is a native of America, and varies in colour, being sometimes black, sometimes azure spotted with black. The female is without horns.

* *centaurus.* The horn on the thorax bent inwards, with two teeth at its base, and bifid at the point; the horn on the head bent back, furnished with one tooth. 92.

* *chorinaeus.* The horn on the breast bent inwards and very thick at the base, bifid at the point; the horn of the head bent back, very long, bifid. Native of Brasil. 96.

* *typhaeus.* *Bull-comber.* With three horns on the thorax, the middle ones smaller than the rest, lateral ones projecting as far as the head does, which is without horns. It is a native of Europe; to be met with under cow-dung. It makes its nest in holes, which it digs deep into the ground. It is black. Head depressed, hairy at the sides, narrow. Knob of the antennæ grayish. Thorax

smooth. The horns sometimes as long as the head, and sometimes twice as long; in the female hardly visible.

Elytra striated. Shanks hairy. 9.

Thorax with four projections like teeth. The horn of the head bent back, and moveable. 116. Native of England and Germany. Black. Elytra striated. Female without horns on the head, or projections on the breast.

Smooth; thorax with two horns; horn of the head notched with one tooth, bifid at the end; elytra smooth. 3. Native of South America. The largest of all known insects, except crabs and monoculi. Elytra black, or azure spotted with black.

N. *Thorax horned.*

β. *Without Scutellum.*

Thorax with six spines; jaws prominent; front sloping; body entirely of a violet colour. 117. Native of Siberia; found under stones; small. Elytra marked with deeply excavated spots.

Horn of the thorax flat, marked with one tooth on the under side; the horn of the head terminating abruptly, with three teeth. 119. Native of the Cape of Good Hope. Middle-sized.

Thorax with three horns, the middle one obtuse, and bifid; horn of the head erect; shield emarginated. 10. Native of Europe; on dunghills. The female always without horns on the breast.

Thorax marked with four projections like teeth; camelus. posterior part of the shield slightly marked with two horns; body black. 134. Native of Germany. The female with nearly the same marks as the male.

b. *Thorax unarmed; Head horned.*

a. *Furnished with a Scutellum.*

Thorax prominent, divided into two lobes; horn of the head simple; elytra striated. 12. Native of the south of Europe. Black.

A triple prominence on the breast; horn on the head bent back; elytra smooth. 15. Native of Europe; met with in dunghills. Its larva gray, with a reddish head, feet, and spiracula or breathing holes. Swammerdam has supposed it to be the *coffius* of the ancients. Vid. *Plin.* 17. 24. Thorax of the female roundish.

β. *Without Scutellum.*

Thorax prominent, formed of two lobes; horn on the head bent back, and simple. 156. Native of the Cape of Good Hope. The horn on the head of the female very short, and terminating abruptly.

Thorax flat, angularly rough; the horn on the head bent

bent inwards; the body of a yellow colour. 22. Native of America. During the whole summer they may be seen in great numbers, rolling about balls which they form out of dung. They mutually assist one another to roll them into holes made for their reception, like the *pilularis*. Their bodies are broad, and depressed; the horn on their heads is placed backwards. It is black, and smooth. In the female it is effaced.

c. Both Thorax and Head without horns.

a. Furnished with a Scutellum.

* *Stenotarsus*. *Dunghill-beetle*. Body black; head marked with tubercles, commonly three in number; the elytra reddish. 32. Native of Europe; frequently to be met with in dung.

* *Stercorarius*. *Clock-beetle*. Body black, smooth; the elytra furrowed; the head of a rhomboidal figure; fore-head prominent. 42. Native of Europe; to be met with in dung; much infested with some species of the *accarus* and *ichneumon*, and, on that account, frequently called *lousy beetle*. It flies about in the evening with a loud noise, and is said to foretel a fine day. It was consecrated by the Egyptians to the sun. It is sometimes of a greenish blue colour. It is likewise sometimes yellowish below, with dusky-red elytra. This is the *shard-borne beetle* of Shakspeare. The female digs a hole, and kneads a lump of fresh dung, generally of a cylindrical shape, on which she deposits one egg, and then covers it with more dung, attaching it to the root of some grass. In a few days the larva breaks the egg, and feeds on the fresh dung. During the autumn it changes its skin four times.

β. Without Scutellum.

Sacer. The shield of the head marked with six denticulations; the thorax notched; the flanks of the hind-legs fringed; top of the head marked with two slight projections. 18. Native of the southern parts of the old continent. It is frequent in dry situations in the southern parts of Russia, where it rolls about cylinders formed of cow-dung. Its figure is carved by the Egyptians on the ancient pillars at Rome.

pilularius. Black, opaque, smooth, yellow underneath; the thorax rounded behind. 40. Native of the south of Europe; of the same size with the lousy beetle. In pairs, they daily roll, like Sisyphus, a ball made of excrement, seven times the bulk of their own body.

Schaefferi. The thorax round; the shield emarginated; the elytra triangular; the thighs of the hind-legs elongated and dentated. 41. Native of Italy, Germany, and Siberia; to be met with on the sunny hills, where it rolls and buries balls made of cow-dung. It is black.

* *fossor*. Thorax retuse; head marked with three tubercles, the middle one faintly resembling a horn. 31. A native of Europe, in sandy places, and in dunghills.

b. Jaw arched, furnished with some teeth; the point of the Abdomen naked, and obliquely truncated. *Melolonthæ*.

* *fullo*. Of a brick colour, and spotted with white. The scutellum with two notches; the antennæ divided into seven leaves. 57. It inhabits sandy situations in Europe and Barbary, living on the oak, *elymus arenaria*, and *arundo arenaria*. It is hairy below: the hooks at the ends of their legs are furnished, at their base, with

a crooked branch. It is the largest coleopterous insect to be met with in Britain, except the stag-beetle. It is but rare in England.

The head and thorax beset with bluish hair; the elytra of a livid colour; the shield bent back at the top.

236. Native of Germany; on the ears of rye.

The head and thorax beset with bluish hairs; the elytra of a brick colour; the legs black. 59. Native of *la*. Europe; to be found in gardens, where its grub proves very destructive to cabbages, &c. and the beetle to the fruit-trees.

The thorax hairy; the elytra of a livid colour, with *agricola*. a black edge, and black band; the shield turned back at the top. 58. Native of Europe, on grass-fields.

The head and thorax covered with bluish hairs; the *abdominal* elytra reddish; the abdomen white and hairy. 40. *nalis*. Native of Europe; resembles the garden-beetle very much, and is very destructive.

Of a shining copper colour; the shield emarginated. *regius*, 241. Native of Africa, near the equator.

Green; the sides of the thorax yellow. 249. *A vitis*. native both of Europe and America; on the vine: very like the *frischii*, differing only from it by the elytra, which are of a brick colour.

Blackish yellow; the elytra of a brick colour. 250. *frischii*. Is a native of Germany; on the vine, and the rose. The elytra, sometimes, are of the same colour with the thorax.

Above smooth, and of a golden colour; the scutellum, and a line on the back of the thorax, of a blood-colour. 253. A native of New Zealand.

Door-beetle, *May-bug*, *Cockchaffer*. Furnished with *melolonthæ* a scutellum; without horns; light brown; the thorax *tha*.

hairy; the tail bent inwards; a triangular white spot at each incisure of the abdomen. 60. It inhabits the northern parts of Europe; flies about in the evening, and feeds on the leaves of trees. It is the most destructive of all the European insects. When it happens to be more plentiful than usual, in the autumn, the vulgar entertain an opinion, that some epidemic diseases are to follow. The male is distinguished by a sharp inflected tail. The grub is gray, with reddish brown head and feet. Eats the roots of plants, particularly of corn, frequently laying waste a great tract of country. They remain six years under ground, before they become beetles. Their thorax varies yearly in colour, from brown to black.

It is furnished with a scutellum, and is without horns; *foliitarsis*. the thorax is hairy; the elytra are of a pale yellow colour, marked with three white parallel lines. 61. Is a native of Europe, to be met with among trees. The claws at the end of the legs, have one little projection, like a tooth, at their base. They make their appearance somewhat later than the May-bug, and are very frequent about the summer solstice.

Body of a brick colour, and woolly below; shield *villosus*. marginated, and bent back; scutellum white. 263. Native of Europe; of the same size with the cockchaffer.

†† *Jaw straight*.

a. *Sharp*. *Cetonia*.

Furnished with a scutellum; without horns; sternum *c rufis*. projecting; scutellum one half shorter than the elytra. 49. Native of South America. Of the same size and colour with the golden beetle.

U

Furnished

fascicularis.

Furnished with a scutellum; thorax marked with four small white lines; elytra green; incisions of the abdomen bearded. 75. Native of the Cape of Good Hope. Covered on the under part of the body with pale red wool, collected into little bundles.

b. *Jaws straight and blunt.* Frischii.

* *fasciatus.*

Furnished with a scutellum; body black, covered with yellow down; elytra marked with two yellow bands uniting into one. 70. Native of the north of Europe; feeding on the flowers of the *Syringa*, *Filipendula*, and on some umbelliferous plants.

* *hemipterus.*

Furnished with a scutellum; thorax downy, edged with two longitudinal wrinkles; elytra shortened. 63. Native of Europe. The larva is found in wood; the beetle on flowers. The female is armed with a stiff, short sting.

** *Feelers terminating in knobs.* Trox.

* *fabulosus.*

Furnished with a scutellum; black, opaque, with wrinkled tubercles; antennæ hairy at the base. 48. Native of Europe. To be met with on sandy hills, which are exposed to the sunshine.

morticini.

Shield unequal and fringed; elytra striated, and marked with convex sharpish points. 404. Native of Tartary. To be found in great numbers, under dead bodies, which have been dried by the sun. It makes a noise, by rubbing its tail against its elytra. Is of an opaque black colour; and of the same size with *sc. fessor.*

*** *Feelers cylindrical: the Club of the Antennæ unincised.*

hemisphaericus.

Hemispherical; the fore part of the shield marked with two obtuse projections. 406. Larger than the *sc. sacer.*

432 species of this genus, have been described by Gmelin, in his last edition of the System of Nature.

2. LUCANUS.

Antennæ clavated; the club compressed, being broadest at the sides, and divided into pectinated leaves. Jaws stretched out, and forked at the points. Two tufts under the lip, to which the feelers are attached.

alces.

The jaws stretched out, and furnished with four teeth at the point. 8. A native of Asia.

* *cervus.*

Stag-beetle. Furnished with a scutellum; the jaws stretched out, and forked at the points, furnished with one lateral tooth. 1. Native of Europe. It is the largest coleopterous insect to be met with in Britain. It feeds on decayed oak. The larva is white and very thick, with head and feet of a rusty colour. By some supposed to be the *crassus* of the ancients. The female smaller than the male.

elaphus.

The jaws projecting, furnished with one tooth, and forked at the point; the lip conical and bent down. 9. Native of Virginia. In the female, which is smaller than the male, the jaws do not project.

capreolus.

Furnished with a scutellum; the jaws projecting, and only forked at the point. 2. It is a native of the south of Europe, and North America; about half the size of the stag-beetle.

20 species of this genus have been described in the last edition of the System of Nature.

3. DERMESTES, *Leather-Eater.*

Antennæ clavated; club perfoliated; three articulations thicker than the rest. Thorax convex, slightly marginated. Head bent and concealed under the breast.

The *larvæ*, or grubs, of this tribe, devour dead bodies, skins, leather, and almost any animal substance; and are exceedingly destructive to books and furniture.

* *Jaw bifid.*

Black; the fore part of the elytra of an ash colour. * *lardarius* 1. It is a native of Europe. Sometimes, though rarely, the anterior part of the elytra is of a rusty colour.

This insect is the common pest of museums, libraries, and preparations of natural history. It is also found in old bacon, whence it has received its name. When it is eating, it protrudes balls of excrement from its anus, which hang down in a string. The larva is oval and hairy.

Black; the elytra livid at the base, and marked with *elongatus*. a band of the same colour, at the posterior part; the antennæ and feet of a rusty colour. 2. Native of Europe; to be met with in old wood; almost filiform.

Oblong, black; the elytra marked with a double * *undatus*. white linear band. 3. A native of Europe. Feeds on putrid animal substances.

Black; the elytra marked with two white spots. 4. * *pellio*. It is a native of Europe. Feeds on skins, bacon, and old books. Its larva is oblong, hairy, and furnished with a bristly tail.

Oblong, of a rusty colour; with red eyes. 19. Na- * *panicus*. tive of Europe. In bread that has been long kept; in bookbinders glue; in books, &c. About the size of a millet seed. The larva is oblong, white and shining.

** *Jaw furnished with one tooth.* Apate.

The elytra reticulated, blunted behind and notched; *muricatus*. thorax prickly and turgid. 6. It is a native of South America; in wood, and sugar canes.

Of a dusky colour; the head drawn back; the an- *ruficornis*. tennæ and feet reddish. 70. It is a native of Europe, and very small.

70 species of this genus have been described in the last edition of the System of Nature.

4. BOSTRICHUS.

Antennæ clavated; the club solid. Thorax convex, and scarcely marginated. Head inflexed and concealed under the thorax.

Black; the elytra and abdomen red; the thorax *capucinus*. flattened. 1. It is a native of Europe, and of Siberia. It is to be found in trunks of trees, particularly dead ones, and in houses.

Of a brick colour; hairy; the elytra striated, blunt- * *tycgra-* ed and notched. 4. It is a native of Europe, and *phus*. America; to be met with under the bark of trees. It is particularly hurtful to the pine tree; very prolific, and very voracious; scooping out furrows under the bark, from which other smaller ones proceed, in a parallel direction. They are very tenacious of life; and according to age and size, vary in colour, from a yellow to a brown, and from that to black.

Black; the elytra red, and notched. 5. It is a na- *chalcogra-* tive *phus*.

tive of Europe; to be found under the bark of trees. It sometimes varies in colour.

polygraphus. Blackish; the elytra are sometimes blunted, and of an azure colour. 6. It is a native of Europe. It forms winding canals under the bark of trees, and is one of the most destructive of this genus.

* *micrographus.* Of a rusty colour; the elytra entire, and of a brick colour. 7. It is a native of Europe; in wood, also within the bark of trees; small, black; the elytra, antennæ, and legs, of a brick colour.

* *piniperda.* Black, and somewhat hairy; the elytra entire, and black; the feet reddish. 13. It is a native of Europe; on the under branches of pine-trees, which it perforates, dries up, and destroys. It sometimes varies in the colour of the elytra.

22 species of this genus have been described in the last edition of the System of Nature.

5. MELYRIS.

Lip clavated, and emarginated. Antennæ perfoliated throughout their whole length. Jaw with one tooth, and pointed.

viridis. Green; the elytra marked with three elevated lines.

1. Native of the Cape of Good Hope.

nigra. Black; the elytra marked with three elevated lines.

2. About the third part of the size of the preceding species.

6. PTINUS.

Antennæ filiform; the articulations towards the points larger than the rest. Thorax roundish, not marginated, receiving the head.

* *Feelers clavated.* Anobia.

rugosus. Brown; thorax unequal; elytra striated. 1. It is a native of Europe; without spots, and double the size of the subsequent species.

* *pertinax.* All over brown. 2. It is a native of Europe; is very destructive to wooden furniture, particularly to articles made of oak; likewise to books, &c. When caught, it contracts itself and counterfeits death. It can be put in motion again, neither by pricking, nor any other means, except by the application of a strong heat. It is destroyed by the *atelabus formicarius*.

* *mollis.* Of a brick colour, with dark-coloured eyes. 3. It is a native of Europe, amongst rubbish; an unwelcome visitor in collections of plants, and to be got rid of effectually, in no other way, but by the heat of an oven. The larva is white, and is capable of enduring a great degree of cold.

* *pulfator.* *Death-watch.* Cylindrical, opaque, and much wrinkled, sprinkled with gray spots. 13. It is a native of Europe. It is common in trunks of old trees, particularly of the willow, and in houses. It beats, especially in the night time, making a noise resembling that produced by one's nail struck against a table. This is done by seven, nine, or eleven distinct strokes, and has been considered, by the vulgar, as foreboding some fatal occurrence to the family occupying the house in which the noise is heard. But, it is nothing more than the call of one sex to the other.

** *Feelers filiform, bifid.* Ptini.

Light brown, and almost without wings; the thorax marked with four projections like teeth; the elytra marked with two white bands. 5. It is a native of Europe, and is exceedingly destructive to seeds, museums, books, furniture, preserved subjects of natural history, and even to the leaves of tobacco. It delights in cold and moisture; and is best kept off by heat and dryness, by arsenic or alum. It is most effectually destroyed by corrosive sublimate. The female is without wings. The larva has six feet, and is soft, thick, and hairy. The pupa is enclosed in a glutinous spherical covering.

Brown; the thorax somewhat crenated; the elytra marked with a white blotch, divided into lobes. 4. It is a native of the north of Europe; to be found in trees. It is about the size of a grain of wheat: the antennæ are of the same length with the body; the legs are of a rusty colour; the scutellum white; the elytra marked with a white spot, resembling the eagle worn on the imperial standard; from whence it has received its name.

The thorax black, and smooth; the elytra connected, shining, brown. 22. It is a native of Europe; on the birch.

32 species of this genus have been described in the last edition of the System of Nature.

7. HISTER.

Antennæ clavated. Club solid, the lower joint compressed, and bent down. Head capable of being drawn back into the body. Mouth furnished with pincers. Elytra shorter than the body. Shanks of the fore-legs notched.

Very large. 1. It is a native of India, similar to *maximus*. the *unicolor*, but ten times larger. The corners of the thorax rounded; point of the breast extended, not quite up to the mouth.

Black; the elytra obliquely striated. 3. It is a native of Europe and America; in sand, and in dung.

Black; the posterior part of the elytra red. 5. Native of Europe; in cow dung.

17 species of this genus have been described in the last edition of the System of Nature.

8. GYRINUS, Whirler, or Water-flea.

Antennæ cylindrical. Jaw very sharp, and horny. Eyes four; two above, and two below.

These little animals are found on the surface of water, on which they run very nimbly, and describe circles. When attempted to be taken, they dive down, drawing after them a bubble, resembling a globe of quicksilver.

Black; faintly striated. 1. Native of Europe; in lakes and ponds.

Black above; below, of a rusty colour; hind-legs bicolour. compressed. 3. Native of Europe; frequents waters; is larger than the *nator*.

Nine species of this genus have been described in the last edition of the System of Nature.

9. BYRRHUS.

Antennæ clavated, and perfoliated. Feelers equal, and somewhat clavated. Jaw bifid. Lip bifid.

gigas. Black; the elytra of a rusty colour, and marked with points. 1. Native of Europe. The anus of the female furnished with a sting.

* *pilula*. Brown; the elytra marked with black grooves. 4. Native of Europe; in sandy places. It is sometimes, though rarely, black.

* *varius*. Black; thorax of a bright yellow; elytra brown, and marked with three short green grooves, spotted with black. 5. Native of Britain.

Nine species of this genus have been described in the last edition of the System of Nature.

10. ANTHRENUS.

Antennæ clavated. Club solid. Feelers unequal, filiform. Jaws membranaceous, linear, bifid. Lip entire.

pimpinella. Black; elytra marked with a white band, and of a rusty colour towards their points, with a white stain. 4. Native of Europe; feeds on the flowers of the *pimpinella*.

* *scrophularia*. Black; elytra spotted with white; tinge of a blood-red colour. 1. Native of Europe; on the *scrophularia*.

* *muscorum*. Clouded; elytra slightly clouded. 2. Found in museums, destroying animals preserved in them, and books.

* *verbasci*. Black; elytra marked with three waved bands. 3. Native of Europe; on the *verbascum*.

Seven species of this genus have been described in the last edition of the System of Nature.

11. SYLPHA, Carrion-Beetle.

Antennæ clavated. Club perfoliated. Elytra marginated. Head prominent. Thorax flattish, marginated.

These are chiefly found under the loose bark of trees, or on the half-decayed carcases of animals, upon which both the grub and the insect feed.

* *germanica*. Oblong, black; shield roundish, unequal, and marginated; elytra very obtuse, with a rusty coloured lateral margin. 1. Native of Germany. There are many varieties of this species. They deposit their eggs in the carcases of other insects, which they bury under ground.

* *vespillo*. Oblong, black; shield almost spherical and unequal; elytra marked with a double rusty-coloured band. 2. Native both of Europe and America.—There are many varieties of this species. In America, some of them are ten times larger than those in Europe. They frequently have the smell of musk, and fly very quickly, with their elytra erect, and applied close together. They are much infested by the *acarus*, and deposit their eggs in the carcases of other insects, which they bury.

* *quadripunctulata*. Black, oblong; elytra marked with two rusty spots. 5. Native of Europe and America, in decayed wood; very smooth; the larva oblong, gray and hairy.

* *quadrimaculata*. Red; thorax and elytra black; the latter marked with two red spots. 27. Native of Europe.

* *rufifrons*. Oblong, smooth, black; the front, the legs, and two

spots on the elytra, of a rusty colour. 41. Native of England. Antennæ black; club reddish; thorax smooth, without spots; elytra smooth.

Blackish; elytra wrinkled, and marked with three elevated lines; thorax wrinkled and scolloped behind. 16. Native of Europe and Asia. It consumes dead bodies, either flesh or fish. When caught, it vomits a very foetid fluid.

94 species of this genus are described by Gmelin, in the last edition of the System of Nature.

12. NITIDULA.

Antennæ clavated. Club solid. Elytra marginated. Head prominent. Thorax a little flattened, and marginated.

* *Lip square*. Elophori.

Brown; thorax wrinkled, which, together with the *aquatica* elytra, are of a brownish yellow. 1. A native of Europe, in stagnant waters; very small, and frequently to be found among the *conserva*.

Brown; thorax wrinkled, and of the colour of brass; *minuta* elytra pale. 4. To be found in England, in stagnant waters; very similar to the *aquatica*, but only the third part of its size.

** *Lip cylindrical*.

Oval, black; elytra marked with a red dot. 5. *bipustata*. It is a native of Europe; and feeds on animal substances.

Black; elytra of a dusky colour at the point. 16. *discoidea*. Native of England.

30 species of this genus have been described in the last edition of the System of Nature.

13. OPATRUM.

Antennæ moniliform, thicker towards the outside. Elytra marginated. Head prominent. Thorax somewhat flat, and marginated.

Of an ash-colour; thorax flat, and marginated; *griseum* elytra marked with three elevated lines, and dentated behind. 1. Native of Italy, larger than the *fabulosum*.

Brown; thorax emarginated; elytra marked with *fabulosa* three elevated lines, and dentated. 2. Native of Europe, and North America, in sandy plains.

Brown; thorax and elytra hairy. 16. Native of *monilicornis* Europe; not quite half an inch in length.

Of a light brown colour; eyes, thorax, elytra, and *testaceum* antennæ dark brown. The base and tips of the latter are reddish; the elytra marked at the base with a large brick-coloured spot, resembling a crescent; the thorax impressed with two dots.

22 species of this genus have been described in the last edition of the System of Nature.

14. TRITOMA.

Antennæ clavated. Club perfoliated. Feelers, anterior pair hatchet-shaped.

Black; the elytra marked with a lateral scarlet line. *bipustata*. 1. Native of England, to be met with in those species *latum* of *boletus* which grow on trees.

Smooth,

glabrum. Smooth, black; the antennæ and legs of a dark colour. 2. Native of the north of Europe, to be met with under the bark of trees. It somewhat resembles the *bipustulatum*.

Seven species of this genus are described by Gmelin in the last edition of the System of Nature.

15. CASSIDA.

Antennæ moniliform. Elytra marginated. Head concealed under the shield of the thorax.

* *viridis*. Green. 1. Native of Europe; frequently met with on thistles, and on a variety of plants. The larva is depressed, and furnished with six feet; it is armed with acute lateral prickles, and has a tail formed of two bristles. It walks about covered with its own excrement.

murraca. Black, with a red shield; the elytra of a blood-colour, sprinkled with black dots. 2. Native of Europe; to be met with on different kinds of plants.

* *nobilis*. Gray; the elytra marked with a very bright blue line. 4. Native of Europe; to be met with on thistles and various plants. The bright blue line on its elytra disappears when it dies, but reappears on its immersion into warm water.

fastuosa. Black; elytra reddish yellow, spotted with black. 52. Native of Europe, but rare. It is to be met with on the white poplar, is about the same size with the *nobilis*, and, like it, loses its bright colour along with its life.

jamaicensis. Of a bright glossy yellow colour; the elytra, without spots, are marked with small concave dots. 21. Native of America. At the anterior part of the future, there is a prominence forming a bunch on its back. It loses its colour in spirits of wine, and recovers it again on being immersed into warm water.

superba. Black; elytra and shield dotted, and of a golden green colour; antennæ, abdomen, and legs green. 39. Native of Europe. It loses its golden colour at the same time with its life.

This genus contains 77 species.

16. COCCINELLA, *Lady-bird*.

Antennæ clavated. Club solid. Feelers, the anterior pair hatchet-shaped; the posterior filiform. Body hemispherical. Thorax and elytra marginated. Abdomen flat.

* *The Elytra red or yellow; marked with black dots.*

marginata. The elytra yellow, without spots, with a black margin; the margin of the thorax marked with two white dots. Sometimes the elytra are red, with a black edge; the margin of the thorax marked with a white dot on each side. 1. Native of America, of a middling size.

immaculata. Elytra yellow, without spots; thorax marked with a black spot, and two white dots. 155. Native of Europe.

* *bipunctata*. Elytra red, marked with two black dots. 7. Native of Europe; frequent in gardens and woods; feeding on *aphides*.

* *quadripunctata*. Elytra yellow, marked with four black dots. 9. Native of Europe. Of a middle size; black below; thorax yellow, with four black dots; feet yellow.

* *quinquepunctata*. Elytra of a blood colour, marked with five black dots. 11. Native of Europe; to be met with on trees.

Elytra red, marked with seven black dots. 15. * *septem-* Native of Europe. The dots on the elytra are placed *punctata* in the form of a triangle. This insect, as well as some others of the coleopteræ, is said to possess the property of giving immediate and effectual relief in the most violent paroxysms of the toothache, by rubbing them between the finger and thumb, and applying the finger to the affected tooth.

Lady-cow. Elytra red, marked with six black spots; * *sexmacu-* the four anterior ones transverse and arched. 68. It *lata* is a native of India. Head whitish; thorax white before with a black spot, black behind; future red; body pale yellowish.

The elytra yellow; with 12 black dots and a black *variegata* band in the middle. 86. It is a native of the Cape of Good Hope; of a middle size.

The elytra tawny, with a great number of black *centu-* dots, many of them running together. 118. It is a *punctata* native of India, about three quarters of an inch long.

** *The Elytra red or yellow, marked with white.*

The elytra red; marked with 14 white, and three *punctato-* black dots. 32. A native of Europe; differing per- *guttata* haps, only in sex, from the *decempustulata*.

Elytra yellow, marked with 15 white spots; the *quindecem-* middle one, common to both elytra, almost effaced. 127. *guttata*. A native of Europe.

Elytra yellow; marked with 16 white spots. 35. *sedecem-* *guttata*. Native of Europe.

*** *Elytra black, marked with red.*

Elytra black, without dots, but marked with red at *analis* the points. 129. It is a native of Europe, very like the *hemorrhoidalis*, but only half its size.

Elytra black, their points red, marked with a black *hemor-* band. 130. It is a native of Germany. It is frequent- *rhoidalis* ly marked on the back with a red dot common to both elytra.

Elytra black, marked with two red spots. 41. It *cacti* is a native of America; on the *cactus*, and is frequently gathered along with the cochineal insect. It is very similar to the *bipustulata*, which is common in Europe.

Elytra black, marked with two red spots; abdomen * *bipustu-* of a blood-red colour. 42. It is a native of Europe, *lata*, common in gardens. Each of the spots on the elytra is composed of three spots uniting into one.

**** *Elytra black, spotted with white or yellow.*

Elytra black, marked with eight yellow dots. 48. *pantherina* Native of the north of Europe.

Elytra black, marked with eight yellow dots, the two *humeralis* anterior ones hooked. 146. A native of Europe.

163 species of this genus have been described by Gmelin.

17. ALURNUS, *Rove-beetle*.

Antennæ filiform. Feelers, six; short. Jaw, horny; arched.

Black; thorax scarlet; elytra yellow. 1. It is a *agrossus* native of America and India. Antennæ black, half as long as the body; thorax a little rough, pointed on each side at the base; the hind margin black; scutellum rounded, black; elytra larger and longer than the body.

Yellowish

femoratus. Yellowish green, with a metallic lustre; the thighs and shanks of the hind-legs dentated. 2. It is a native of India. It is large, smooth, and shining; the antennæ are half as long as the body; the extreme articulations are black.

dentipes. Black; the thighs and shanks of the hind-legs dentated. 3. Native of the Cape of Good Hope. It is smooth, without spots, and very similar to the *al. femoratus*.

There have been only three species of this genus described.

18. CHRYSOMELA.

Antennæ moniliform. Feelers six, growing thicker towards their exterior sides. Thorax marginated; elytra not marginated. Body (in most of the species) oval.

This numerous and beautiful tribe is found everywhere, in woods and gardens. Their motion is slow, and some of them when caught, emit an oily fluid of a disagreeable smell. The larvæ of this and the next family feed on the leaves of trees and plants, the fibres and cuticle of which they leave, contenting themselves with the pulp.

* *Thighs of the Hind-legs equal.*

* *tenebrioides*. Without wings, black; antennæ and legs of a violet colour. 1. It is a native of the south of Europe. The larva has a bunch on its back, of a violet colour, with a red anus; it feeds on a variety of vegetables.

* *gottinensis*. Black; the legs of a violet colour. 4. It is a native of Europe, very rare in England.

* *vittata*. The elytra blue, with a yellow edge, and marked with a yellow stripe in the middle. 3. It is a native of America; very large.

* *lusitanica*. Thorax of a copper colour; elytra resembling brass; impressed with bluish dots, of a violet-colour underneath. 74. Native of Portugal.

* *banksi*. Of a brass colour above, and of a brick colour below. 76. Native of Italy and Portugal, smaller than the preceding species. Very rare in England.

* *hemorrhoidalis*. Black, shining; antennæ yellow at the base; anus red above. 6. Native of Europe, on the birch and alder. The elytra are marked with regular lines of dots.

* *graminis*. Greenish-blue, very shining; the antennæ and legs of the same colour. 7. Native of Europe, on different plants, especially on grass.

* *anea*. Green, shining; the extremity of the abdomen reddish. 8. Native of Europe; on the alder.

* *hemoptera*. Of a violet-colour; feet and wings red. 11. Native of Europe.

* *centaurei*. Of a bright copper-colour; beneath green and gold; the legs of a bright copper colour. 102. Native of Europe, on the *centaureus*. It exhibits some variety, especially in size.

* *melarostoma*. Oblong, black; head red, the mouth and a spot on the back part of the head black; the thorax red, with a black spot on each side; the elytra red, with a black future. 254. Native of Europe.

* *polita*. Thorax gilt; elytra reddish. 27. Native of Europe; to be met with on the poplar and willow.

* *cruentata*. Black; the elytra smooth; marked with red waved

cross bands, and with spots of the same colour. 182.

Native of South America.

Blackish-blue; the elytra blackish-yellow, marked * *anglica*, with dots arranged in straight lines; wings red. 187. Native of England.

** *The Thighs of the Hind-legs thickened, and formed for leaping.* Alticæ.

Of a greenish-blue. 51. Native of Europe. It * *oleracea*, feeds on different kinds of plants, particularly on those of the class *tetradynamia*. This is the little insect which is so troublesome in fields and gardens, commonly called *turnip-fly*. It attacks turnips, radishes, and cabbages, when newly sprung above ground, and consumes their seminal leaves. It frequently destroys whole fields of turnips, so completely, as to render a second sowing necessary, which goes like the first. The attempts may be repeated with similar success, till the season for sowing be lost.

Blackish blue, the head and four fore-legs yellow. 53. *chrysocephala*. Native of Europe.

Greenish blue; the legs testaceous; the thighs of the *hyoscyami* hind-legs of a violet-colour. 54. Native of Europe; on the herbaceous, turnip, and cabbage.

Black; the elytra marked with four reddish spots. * *quadripustulata*. 217. Native of England and France, in gardens.

Black; the elytra and lower part of the legs pale. * *anglicanatales*. 218. Native of England, on various sorts of vegetables.

Greenish yellow, with a metallic lustre; legs black. * *nigripes*. 220. Native of England.

Of a violet-colour; head and thorax reddish; legs * *fuscipes* black. 224. Native of Britain, on plants of various sorts.

Testaceous, hunch-backed; elytra very smooth. 225. * *testacea*. Native of England, on different kinds of vegetables.

Blackish yellow; oblong, with black legs. 246. *cruciferarum*. Native of Europe, on *tetradynamious* plants.

270 species of this genus have been described by Gmelin in the last edition of the System of Nature.

19. CRYPTOCEPHALUS.

Antennæ filiform. Feelers four. Thorax marginated.

Elytra not marginated. Body nearly cylindrical.

* *Feelers equal, filiform.*

† *Jaw furnished with one tooth.*

a. *Lip entire, Body cylindrical.*

Dusky black; the elytra pale, marked with three black *longipes* blotches; fore-legs very long. 1. Native of Europe, on the hazel and willow.

Black; the elytra red, marked with two black dots; * *quadri-* the antennæ short and ferrated. 3. Native of Europe, *punctatus*, very common on the hazel. The larva is contained in a rough bag; which, on the fore-part, is terminated obliquely and abruptly.

Of an obscure brass colour; the elytra of a brick colour, *longima-* with a black spot at the base. 19. Native of Europe; *nus*, feeds on the *trifolium montanum*, and the *euphorbia cyparissia*; the fore-legs are very long; the larva is enclosed in a bag.

Thorax variegated; elytra reddish, marked with two *cordiger* black dots. 25. Native of Europe, on the hazel and willow.

willow. The spot on the middle of the thorax is sometimes of the shape of a heart.

* *vitis*. Black; smooth; elytra reddish. 27. Native of the south of Europe; on the vine, committing sometimes great havock.

coryli. Black; thorax and elytra reddish brown, without spots. 28. Native of Europe; on the hazel.

b. *Lip bifid*; *Body oblong*. Cistelæ.

gigas. Hairy, brown; elytra, abdomen, and thighs of a brick colour. 91. Native of the south of France; very large.

* *cervinus*. Livid; with brown legs. 92. Native of the north of Europe.

rustarvis. Black; thorax square; elytra striated and of a brick colour. 96. Native of the south of Europe; on the ears of rye.

* *fulpburus*. Yellow; the elytra of a sulphur colour. 98. Native of Europe. Feeds on *umbelliferous* plants.

* *murinus*. Black; the elytra and legs reddish brown. 103. Native of the north of Europe.

* *angustatus*. Thorax and elytra of a dark reddish colour, black in the middle. 106. Native of Britain; somewhat resembling the *murinus*, but narrower.

* *pallidus*. Pale; the head, and tips of the elytra, brown. 107. Native of Britain.

†† *Jaw bifid*, *Body oblong*. Criocerides..

lineola. Gray; the thorax marked with a line behind; the elytra with a black dot at their base. 124. Native of Italy.

nymphææ. Brown; the margin of the elytra a little prominent and yellow, 125. Native of Europe, on the water-lily.

tenellus. Of a rusty colour, the edge of the thorax and elytra yellow. 133. Native of Europe, on the willow.

* *cantabroides*. Of a violet colour; head, thorax and legs reddish. 139. Native of Britain.

* *cyarella*. Blue; thorax cylindrical; prominent on the sides. 161. Native of Britain.

melanopus. Blue; thorax and legs reddish. 162. Native of Europe. Feeds on the oak.

* *subspinosus*. Black; head and thorax somewhat prickly; feet reddish. 164. Native of Britain.

* *asparagi*. Thorax red, marked with two black dots; elytra yellow; marked with a black cross, and four black dots. 167. Native of Europe, feeding on asparagus. There are two or three varieties of this species. β . With two spots on the elytra connected at the base, is to be met with in Italy. γ . With two narrow red bands on the elytra, is to be met with in France.

* *phellandrii*. Black; the edge of the thorax and two lines on the elytra yellow. 168. Native of Europe; to be found at the roots of the *phellandrium aquaticum*.

** *Feelers unequal*, *the anterior ones hatchet-shaped*.

† *The Lip of a substance like horn*. Erotyli.

giganteus. Oval, black; the elytra marked with a great many tawny dots. 191. Native of India.

veneratus. Black; the thorax and elytra of a bright copper colour. 205. Native of New Holland.

†† *The Lip membranaceous*. Lagriæ.

Black; the thorax red and hairy. 221. Native of Europe, particularly of England. * *elongatins*.

Smooth; thorax reddish; elytra yellow. 230. Native of England. * *glabratus*.

268 species of this genus have been described in the last edition of the System of Nature.

20. HISPA, *Blossom-eater*.

Antennæ cylindrical; approaching one another at the base, and placed between the eyes. Feelers spindle-shaped. Thorax and elytra frequently prickly.

Body entirely black; antennæ spindle-shaped; thorax and elytra prickly. 1. Native of the south of Europe and north of Africa. To be found at the roots of gras. * *atra*.

Without prickles; the antennæ hairy. 4. Native of Europe; in rubbish and in museums. * *mutica*.

Antennæ serrated; thorax red; elytra blue; head furnished with two horns. 15. Native of Britain. * *cornigera*.

Black; the antennæ pectinated; the elytra striped. 19. Native of England. * *stbellicornis*.

20 species of this genus have been described in the last edition of the System of Nature.

21. BRUCHUS, *Glutton*.

Antennæ filiform. Feelers equal and filiform. Lip pointed.

The elytra black, spotted with white; the anus white, with two black spots. 1. Native of North America. * *pisi*. It has been lately introduced into Europe, where it commits great havock in the fields of peas. It is also very destructive to orchards when in bloom.

Gray, somewhat shining; the elytra very little shorter than the abdomen. 9. Large; and has been introduced into Europe, along with the seeds of the *robinia pseudacacia* from America.

Black; the elytra red, marked with raised stripes. 11. Native of Europe, chiefly on the horse-chestnut. * *scabrosus*.

Body brown, spotted with gray. 13. It feeds on cacao. the seeds of the *theobroma*.

The elytra gray; spotted with black; legs red; theobroma-cutellum white. 2. Feeds on the seeds of the *theobroma*.

Ash coloured; elytra brown; with a black dot at the base; surrounded by a yellow circle. 17. Native of Switzerland, on different plants. * *bipunctatus*.

Elytra black; speckled with white; the thighs of the hind-legs are marked with a single projection resembling a little tooth. 5. Native of Europe. Feeds on the seeds of various plants. * *granarius*.

Black; the base of the antennæ and fore feet reddish brown; thighs smooth. 6. Native of Europe, on flowers; very small. * *seminarius*.

25 species of this genus have been described in the last edition of the System of Nature.

22. PAUSUS,

Antennæ consisting of two articulations, clavated. Club solid and hooked.

*microce-
phalus.*

1. It is a native of North America; entirely black, the head very small, the thorax narrow, with an elevated transverse margin on the fore-part; the elytra terminated abruptly by a transverse line, and a little longer than the abdomen; which is likewise terminated abruptly. It is about the size of the *dermestes lar-darius*.

23. ZYGIA.

Antennæ moniliform. Feelers unequal, filiform. Lip elongated, membranaceous. Jaw furnished with one tooth.

oblonga. Oblong, reddish; head and elytra of an obscure blue.
1. Native of the east.

24. ZONITIS.

Antennæ setaceous. Feelers four, filiform; shorter than the jaw, which is entire. Lip emarginated.

*chrysome-
lina.* Yellow; the elytra marked with a black dot in the middle and at the base. 1. Native of Egypt. Black below; the extremity of the abdomen reddish.

flava. Reddish; the elytra yellow and black at the tip. 2. Native of the east.

25. APALUS.

Antennæ filiform. Feelers equal; filiform. Jaw horny; furnished with one tooth. Lip membranaceous; terminating abruptly, and entire.

*bimacula-
tus.* Furnished with wings; black, the elytra yellow, marked with a black dot behind: formerly *meloë bi-maculatus*. Native of the north of Europe; to be seen early in the spring, in sandy places.

26. BRENTUS.

Antennæ moniliform, advancing beyond the middle of the snout. Mouth furnished with a straight, cylindrical snout, which projects considerably.

* *Thighs simple.*

*barbicor-
nis.* Cylindrical; snout very long, bearded beneath; the elytra lengthened out and elevated. 1. Native of New Zealand. Snout longer than the body; antennæ shorter than the snout, placed near the tip; eyes globular, black; thorax cylindrical, black with gray hairs; elytra streaked and dotted, with furrowed spots; legs black, with gray hairs.

** *Thighs dentated.*

anchorago. Linear; the elytra striped with yellow: thorax lengthened. Native of South America and India.

This genus includes 11 species.

27. CURCULIO, *Diamond-beetle.*

Antennæ clavated, placed upon the snout, which is formed of a horny substance, and prominent. Feelers four, filiform.

This beautiful and numerous genus is divided into five subdivisions: their larvæ have a scaly head, and six scaly legs. Those of the long-snouted ones are most

destructive in granaries and to seeds of almost every description. They insinuate themselves into the grain, and consume it gradually, leaving nothing but the skin, in which they lie concealed, and undergo their metamorphosis. Those with the short snout infest artichokes, and the stalks and leaves of plants. The leaves of many trees, particularly the elm, may be seen marked with yellow spots, occasioned by the larvæ of this tribe insinuating themselves within the cuticle of the leaf, and forming a bag, in which they lurk, till they come forth a perfect insect.

* *Long-snouted.*

† *Thighs simple.*

The thorax and elytra rough. Antennæ white at *gigat.* the tips. Native of Japan. Snout cylindrical, long, arched, brown on the fore part, of an ash-colour behind; thorax rounded, brown, rough, with raised sharp points; elytra rough, gray, with scattered brown and white dots.

Black; thorax flat and dotted, with a line slightly *brachy-* elevated; elytra shortened and somewhat striped: the *pteros.* intervals dotted. 555. Native of Europe.

Black; the elytra marked with white dots set in regu-*undatus.* lar rows, and with white interrupted waved bands. 556. Native of Europe.

Scarlet; the elytra marked with ten rows of dots. *coccineus.* 558. Native of Europe.

Black; the elytra of a violet colour; the scutellum *cyaneus.* white. 5. Native of Europe, particularly on the wil-
low.

Black above; ash-coloured below, and hunch-back-*cracca.* ed. 6. Native of Europe; feeds on the seeds of the vetch; it is very small.

Gray; the elytra and legs reddish brown. 101. Na- * *malva.* tive of England, on the mallow. The snout and abdo-
men black.

The snout and thorax red; the elytra of a violet *roboris.* colour. 103. Native of Europe, on the oak.

Black; with the abdomen oval. 13. Native of the *acridulus.* north of Europe, frequently to be met with on plants of the class *tetradynamia*.

Of a blood-colour. 15. Native of Europe, and *frumenta-* very destructive to corn which has been long kept. *rius.*

Black; the thorax dotted, and of the same length *oryzæ.* with the elytra; the elytra marked with two red spots. This species is very destructive to rice kept in granaries.

Weevil or Bond. Black; the thorax dotted, and of * *granari-* the same length with the elytra. 16. This destructive *us.* little animal does much mischief in granaries, and in biscuit kept in ware-houses, or on ship-board. Woad, henbane, and elder, are said to drive them away from grain which has been infested by them, and, on that account, is sometimes mixed with the grain.

The elytra of a brick colour, with cloudy bands. 19. * *pini.* Native of Europe; in the bark of the *pinus syl-* *vestris.*

Black, sprinkled with green: snout black and bent, *cynaræ.* somewhat resembling a keel. 121. Native of Africa, and the south of Europe: on the flowers of the arti-
choke.

Cylindrical and ash-coloured; the elytra set with * *paraplec* sharp *twis.*

sharp points. 34. Native of Europe; on umbelliferous plants, particularly on the *phellandrum aquaticum*; in the stalks of which the larva is frequently lodged, and is supposed to be the cause of the staggers in horses.

bardanae. Cylindrical; covered with a gray down; the fore-legs long. 152. Native of Europe, on the burdock. When old, it loses the gray down, and becomes smooth and black.

bacchus. Of a bright copper-colour; snout and feet black. 38. Native of the south of Europe, on the vine and hazel. Somewhat hairy above.

frugilegus. Oblong; of a chestnut colour; the elytra equalling the thorax, marked with four red spots. Native of South America and India. It is small, and very destructive to grain.

†† *Hind-thighs thickened*. Saltatorii.

* *quercus*. Pale yellow; eyes black. 25. Native of Europe; on the willow, elm, and oak, the leaves of which it frequently covers with blotches, by insinuating itself within the cuticle. It is about the size of the *pediculus humanus*.

segetis. Body black; elytra oblong. 45. Native of Europe; on the ears of corn.

††† *Thighs dentated*.

aterrimus. Black; the elytra shining. 10. Native of Europe; very frequent on plants of different kinds.

* *cerasi*. Black; the elytra opaque and oblong. 11. Native of Europe; on the leaves of the cherry and pear-tree, the cuticle of which it eats.

* *pomorum*. The thighs of the fore-legs dentated; body gray, clouded. 46. Native of Europe, on the flowers of fruit-trees.

* *caliginosus*. The streaks of the elytra approaching one another, and dotted. 243. Native of Britain, but rare. Body oblong, entirely black, opaque; thorax rounded and punctured; elytra with deep approximate striæ in pairs; thighs sharply dentated.

* *germanus*. Black; the thorax marked with two reddish dots on each side. 58. Native of Europe; very common in Germany. It is amongst the largest of this genus that is to be met with in Europe.

* *nucum*. Body gray, of the same length with the snout. 59. Native of Europe; frequently to be found in hazel-nuts.

* *scrophularia*. The elytra marked with two black spots situated near the suture. 61. Native of Europe; on the figwort, the capsules of which the larvæ consume, and substitute in their place brown follicles.

** *Brevirostris*.

† *Thighs dentated*.

spectabilis. The body variegated with green and black. 298. Native of New Holland.

fusco-maculatus. Black; the thighs faintly dentated; the thorax and elytra smooth, spotted with brown. 301. Native of Europe; large, smooth.

ovatus. The abdomen oval and black; the legs and antennæ reddish. 69. Native of Europe; in orchards.

* *pyri*. Yellowish-brown. 72. Native of Europe. The larva feeds on the leaves of the pear-tree; the perfect insect on the flowers of the pear and of the plumb. The colour varies; sometimes it is bronzed, red, green,

&c.; legs reddish; body covered with oblong scales of various colours; elytra striated, punctured.

Downy, brown; the thighs acutely dentated; antennæ and legs brownish. 308. Native of Europe; on the apple-tree.

†† *Thighs smooth*.

The thorax marked with lines; the elytra of an ash-*polygoni* colour, marked with little brown lines; the suture brown, dotted with black. 26. Native of Europe; on the *polygonum*.

Above, brownish-gray; beneath, ash-coloured; * *griseus*. snout grooved. 335. Native of Britain.

Blackish; the elytra gray, marked with two white * *triguttata* spots, and with a larger one behind, which is common to both elytra. 336. Native of Britain.

The elytra marked with black elevated stripes, and with bright green and gold dotted furrows alternately, swelling out at their base, and drawing to a point at their tips. 349. Native of South America. It is very large, and the most beautiful insect hitherto known; commonly known by the name of the diamond-beetle.

Body green, silky, striped with broad gold bands. *regalis*. 75. Native of South America. The thighs brown, marked with a golden ring.

Oblong, brown; the back part of the thorax flat. * *incanus*. 81. Native of Europe; common in fir.

616 species of this genus have been described in the last edition of the System of Nature.

28. RHINOMACER.

Antennæ fetaceous, placed upon the snout. Feelers four, thicker towards their exterior side.

Covered with gray down; antennæ and legs black. *curculioides*. 1. Native of Italy.

Covered with black hair; antennæ and legs reddish. *attelaboides*. 2. Native of Europe; in pine-forests.

Blue, somewhat hairy; base of the antennæ and the legs yellow. 3. Native of Europe.

Only three species of this genus have been described.

29. ATTELABUS.

Head drawn to a point on the hind part, and inclined.

Antennæ moniliform, the articulations towards the point thicker than the rest.

* *Jaw bifid*.

Black, the elytra red and reticulated. 1. Native of Europe; on the leaves of the hazel, which it rolls up into cylinders and shuts up at both ends.

Black; legs formed for leaping. 7. Native of Europe; on the leaves of the birch, which it renders beautifully curled by its gnawing. It leaps very nimbly.

** *Jaw furnished with one tooth*.

† *The posterior feelers hatchet-shaped*. Cleri.

Black; the elytra marked with three white bands, and red at the base. 19. Native of Europe.

Black; thorax reddish; elytra red, white at the base, * *formica-andrius*.

and marked with two white bands. 8. Native of Europe: it destroys the *pinus pertinax* and many other insects.

* *apiarius*. Bluish; the elytra red, marked with three black bands. 10. Native of Europe and America. The larva is frequently to be met with in bee-hives, the perfect insect on flowers. It is double the size of the *formicarius*.

†† *Feelers four, nearly filiform.* Spondilides.

ceramboi- Black; the elytra full of wrinkles, and broader than des. the thorax. 12. Native of Europe, in the *boletus fomentarius*.

buprestoi- Black; the elytra very much ribbed; the thorax al- des. most globular. 13. Native of Europe, in woods.

There are 34 species of this genus.

30. NOTOXUS.

Antennæ filiform. Feelers four, hatchet-shaped. Jaw furnished with one tooth.

* *mollis*. Downy; the elytra black, marked with three pale bands. 3. Native of Europe; on flowers.

* *monoceros*. Thorax projecting over the head like a horn; elytra pale, marked with a black band and dot. 4. Native of Europe, on umbelliferous plants.

There are four species of this genus.

31. CERAMBYX.

Antennæ setaceous. Feelers four. Thorax prickly or turgid. Elytra linear.

This is a very beautiful and finely variegated family. The larvæ resemble soft, oblong, slender worms, with a scaly head and hard legs on the fore-part. They bore through the inner part of trees, pulverising the wood, and are transformed into perfect insects in the cavities they make. Many of them diffuse a strong smell, perceivable at a great distance; and some, when taken, utter a sort of cry, produced by the friction of the thorax on the upper part of the abdomen and elytra.

* *Feelers four, equal.*

a. *Filiform.*

† *Jaw cylindrical, entire.* Prioni:

a. *The Thorax furnished with moveable spines.*

trochlearis The elytra variegated with a dark colour and white, with raised dots. 2. Native of India.

longimanus. The elytra marked with a small projection at their base, and with two at the tip; the antennæ long. 1. Native of South America. The shanks of the fore-legs, in the male, are very long.

b. *Thorax marginated.*

cervicornis The thorax with three little projections on each side; the jaws stretched out, and furnished with one spine on their outside; the antennæ short. 3. Native of America. The larva is found in the wood of the *bombax*. It is eatable, and reckoned a delicacy by the natives.

The thorax furnished with four small projections on *armillatus*. each side; the elytra rusty-coloured, edged with black; the thighs of the hind-legs marked with a little projection. 4. Native of India; very large.

Thorax furnished with very small projections; the *damicornis* jaws stretched out, and furnished with two teeth; the antennæ short. 86. Native of South America. The larva is eaten by the natives, and much relished.

The thorax wrinkly and marked on each side with a *faber*. small projection; the elytra black; the antennæ of a middling length. 6. Native of Europe; in wood.

Thorax marked with three small projections; body * *coriarius* black; the elytra furnished with sharp points; antennæ shorter than the body. 7. Native of Europe; on decayed birch-trees. It produces large, oblong, yellowish eggs.

†† *Jaw obtuse, furnished with one tooth.* Cerambyces.

Thorax prickly; elytra formed like the roof of a *nebulosus*. house, marked with black bands and dots; the antennæ longer than the body. 29. Native of Europe; in the stems of fir-trees, which it kills by consuming the inner bark.

Thorax prickly; elytra entire, marked with three *fascicula*-prickly dots; the antennæ of the same length with the *tus*. body. 106. Native of Europe.

Thorax prickly; elytra whitish at their anterior part, * *bispidus*. and furnished with two small projections at their tips; the antennæ of the same length with the body, and rough. 30. Native of Europe.

Green shining; thorax prickly; antennæ blue, and * *mosc ha* of the same length with the body. 34. Native of *tus*.

Europe; on the willow. The colour of the antennæ and legs varies from a blue to brown. The living insect has a smell of musk, which is said to have a soporific effect. It produces white eggs. The green colour of this insect is sometimes tinged with blue, and at other times it is entirely blue and gold. The smell it diffuses, is imagined by some to resemble the smell of a rose, and frequently pervades a whole meadow, where the insect happens to be plentiful.

Black; the thorax prickly and wrinkled; the elytra *heros*. somewhat prickly and reddish brown; antennæ long. 128. Native of Europe; on the oak.

††† *Jaw divided.*

* *Horny.* Lamix.

Thorax prickly; elytra black, with rusty-coloured *futor*. spots; scutellum yellow; antennæ very long. 38. Native of Europe; in woods.

Black; thorax prickly; scutellum bright yellow; *fartor*. elytra without spots; antennæ very long. 159. Native of Europe; larger than the preceding species.

Thorax prickly; elytra black and convex; antennæ *textor*. of the same length with the body. 41. Native of Europe; on trunks of trees.

Black; thorax somewhat prickly; elytra ash-colour-*fuliginator* ed; antennæ short. 43. Native of Europe. When old, it becomes entirely black. It is met with in wool, after it has been cut from the sheep.

Thorax prickly, and marked with green bands; the *regalis*. elytra sprinkled with green, with three tawny spots. 167. Native of Africa. Antennæ longer than the body, black; head beneath lined with green; a tawny spot under

under the eyes; thorax black, with three impressed green bands; elytra somewhat striated; black sprinkled with green; abdomen with a white line of tawny dots on each side.

** *Membranaceous*. Saperdæ.

carcharias Thorax smooth, cylindrical; body gray, dotted with black; antennæ of the same length with the body. 52. Native of Europe.

cardui. Of a dusky colour; thorax marked with lines; scutellum yellow; antennæ long. 56. Native of Europe; on thistles, injuring them much in the month of May. Body brown, speckled with yellow; thorax marked with three yellow lines.

* *populneus*. Thorax without spines, cylindrical, yellow, and marked with lines; elytra marked with four yellow dots; antennæ of the same length with the body. 57. Native of Europe; on the poplar. Body brown; antennæ variegated with black and white.

* *cylindricus*. Cylindrical black; fore-legs yellow. 5. Native of Europe; on the pear and plum-tree.

β. *Feelers capitated*. Rhagia.

cursor. Thorax prickly; elytra obtuse and reddish, marked with a black line, and black along the suture; antennæ of the same length with the body. 45. Native of Europe.

* *anglicus*. Thorax prickly; elytra marked with two oblique yellow bands. 237. Native of Britain.

inquisitor. Black; thorax prickly; elytra clouded with brick-coloured stripes; antennæ shorter than the body. 49. Native of Europe, on the trunks of trees. The larva has six feet, and is naked; white; head and collar horny, brown; back grooved.

elegans. Black; thorax with a spine on each side; elytra chestnut-coloured; their base entire, and a spot on each, are black; they are likewise marked with two yellow bands. 242. Native of Europe.

γ. *Feelers clavated*. Callidia.

* *ruficus*. Thorax naked; body pale; the antennæ tapering, and shorter than the body. 67. Native of Europe; in woods.

luridus. Thorax naked and furnished with knobs, black; the elytra of a brick colour. 68. Native of Europe; in fir-woods.

* *violaceus*. The thorax somewhat downy; body of a violet colour; antennæ shorter than the body. 70. Native of Europe; chiefly in fir-wood, which has been cut down some time, and which has not been stripped of its bark. It bores serpentine cavities between the bark and the wood, which are larger in diameter as the insect increases in size, filling the space it leaves behind with its excrement, which resembles saw-dust. Body dark violet, a little hairy; antennæ hardly as long as the body, hairy; sternum with a small projecting point; elytra linear, rounded at the tip, turgid at the base. It varies in having the head and thorax, and even the body, greenish.

* *bojulus*. Thorax hairy, marked with two protuberances; body brown. 76. Native of Europe, on the trunks of trees, in timber, in houses, perforating the joints, particularly those that have been formed of fir-timber.

** *Feelers unequal; the anterior pair filiform, the posterior clavated*. *Stenocori Fabricii*.

Thorax slightly prickly; elytra formed like the roof of a house; the anterior part of them reddish brown; the breast shining. 47. Native of Europe. Male of a brick colour, female blackish; larva lives under ground, and has very long legs.

379 species of this genus have been described in the last edition of the System of Nature.

32. CALOPUS.

Antennæ filiform. Feelers four; the anterior ones clavated; the posterior filiform. Thorax turgid. Elytra narrow, and of an equal breadth throughout their whole length.

Brown; the antennæ compressed. 1. A native of Europe; it is long, and cylindrical.

Very small, brown; the antennæ serrated and hairy. *pygmaeus*. 3. A native of Europe; about the size of a flea.

There are three species described in the last edition of the System of Nature.

33. LEPTURA.

Antennæ setaceous. Feelers four, filiform. Elytra growing smaller towards the tip. Thorax somewhat tapering.

* *Lip entire*. *Donacia* of Fabricius.

Of a golden colour; the thighs of the hind legs clavated and notched. 1. A native of Europe; on aquatic plants, on the water-lily, *phellandrum aquaticum*, at the roots of which the pupa may be found enclosed in brown globes. The thighs of the hind-legs are sometimes without notches. Antennæ blackish, the joints pale, reddish at the tip; head with a little down on the middle; thorax grooved; elytra streaked, dotted, and terminating abruptly, with short appendages at each margin; body beneath downy; legs dull, brownish red.

Of a golden colour; the thighs simple. 17. A native of Britain; on aquatic plants.

Shining green golden colour; the elytra marked with dotted streaks and with crenated wrinkles, likewise with a bright purple and green fillet; the abdomen, antennæ, and legs, of a golden colour; the thighs of the hind-legs notched. 88. A native of Europe.

Silvery green; the elytra marked with dotted streaks, crenated wrinkles, with a broad green and purple fillet common to both elytra; the head, abdomen, and legs, of a golden colour; the thighs of the hind-legs without notches. 89. A native of Europe.

** *Lip bifid*. *Lepturae*.

A. *The Thorax on the fore part somewhat oblong and narrow*.

Black; the elytra reddish, with a black dot in the middle. 22. A native of Europe.

Black; elytra red, black at the tips and at the suture. 23. A native of Europe. The abdomen is reddish in the male, which is smaller than the female.

melanura. Black; the elytra reddish or livid, black at the tips and at the base. 2. A native of Europe; the elytra are black at the tips in the male, in the female they are all of one colour.

* *rubra*. Black; the thorax, the elytra, and flank of the legs, purple. 3. A native of Europe; on flowers.

* *villica*. Of a rusty colour; the antennæ, elytra, and breast, dark brown. 28. A native of Britain.

splendida. Black; covered with yellow hairs; the elytra smooth at the tips; the legs tawny; antennæ brown, and of a rusty colour at the base. 49. A native of Europe.

rufipes. Black; the legs reddish; the thighs red at the base. 52. A native of Europe; frequently to be met with in the month of May, on the buckthorn, the dog-wood, and hawthorn.

B. *The Thorax nearly globular, and not attenuated on its anterior part; the Elytra blunt at the tips, but not truncated.*

* *virginia*. The thorax globular and black; the elytra of a reddish colour; the abdomen reddish. 15. A native of Europe.

* *collaris*. The thorax globular and red; the abdomen red; and the elytra black. 16. A native of Europe.

bipartita. Black; the thorax of a rusty colour, marked with a longitudinal black line; the elytra marked with a rusty-coloured spot, common to both of them. 71. A native of Europe.

nitens. The thorax globular, which, as well as the abdomen, is of a shining black, covered with a yellow down; the elytra black, marked with four broad transverse yellow bands; the legs of a rusty colour. 67. A native of America.

100 species of this genus have been described by Gmelin, in the last edition of the System of Nature.

34. NECYDALIS, Carrion-Eater.

Antennæ either setaceous or filiform. Feelers four, filiform. Elytra smaller, shorter, or narrower than the wings. Tail simple.

* *Antennæ setaceous; Elytra shorter than the wings or abdomen.*

* *major*. The elytra of a rusty colour, without spots; the antennæ shorter than the body. 1. A native of Europe.

* *minor*. The elytra reddish brown, with a small line at the top; the antennæ larger than the body. 2. A native of Europe.

* *umbellatarum*. The elytra of a brick colour, without spots; the antennæ long. 3. A native of Europe; on umbelliferous plants.

** *Antennæ filiform; the Elytra growing narrower towards the tips, and of the same length with the abdomen.*

* *viridissimus*. The thorax somewhat tapering; body green. 13. A native of Europe; very frequent in gardens.

* *humilis*. The elytra black, yellow at the base. 18. A native of Britain.

melanura. Black; the thorax and elytra reddish brown; the latter are black at the tips. 20. A native of Europe; on plants of different kinds.

26 species of this genus have been described in the last edition of the System of Nature.

35. LAMPYRIS. Fire-Fly.

Antennæ filiform. Feelers four. Elytra flexible. Thorax flat, hemispherical, surrounding and concealing the head under it. The sides of the abdomen furnished with folded papillæ. The female in most of the species without wings.

* *Feelers nearly clavated.*

Glow-worm. Oblong, brown; shield ash-coloured. * *noctiluca*. 1. A native of Europe; in woods and meadows. The female is larger than the male, and emits a beautiful phosphoric light, for the purpose of attracting the male. It is apparent that their shining light depends on a fluid placed near the extremity of the abdomen; the light becomes brighter, and of a finer green colour, when the insect is in motion. The little animal can withdraw the light at pleasure by contracting itself. Though the insect be bruised, the light continues for a considerable time.

Dusky black; the shield marked, on both sides, with a circular rose-coloured spot. 2. A native of North America.

Oblong, brown; the shield resembling glass at the tip. 3. A native of Europe; in woods. This has been thought only a variety of the *noctiluca*; it is peculiarly resplendent in showery weather. The female emits the brighter light, particularly when pregnant.

The shield reddish, and black in the middle; the elytra black, with a white edge; the abdomen white.

4. A native of the south of America.

Yellow; the third segment of the abdomen from the anus is black. 22. A native of Japan; very plentiful in the months of May and June; diffusing a very strong light from two small bags at its tail, filled with air; eyes, antennæ, and wings black.

The elytra brown; the thorax transverse, red. 11. *italica*. A native of Italy and Switzerland; on trees; less than the rest of the genus; brown; the last two segments of the abdomen yellow; the breast and legs pale yellow; the female black.

** *Feelers nearly filiform.*

Black; the sides of the thorax and elytra of a blood colour. 17. A native of Europe; in stony ground.

Black; the thorax and elytra of a brick colour; antennæ pectinated. 34. A native of Europe.

Black; the thorax and elytra of a blood colour, and without spots. 18. A native of Europe; in hedges; head sometimes reddish, the elytra sometimes striated.

*** *Feelers with the last joint thicker than the rest, and terminating abruptly.* Lyci.

Yellow; elytra with a black marginal spot, and black behind, the lateral margin very much dilated. 14. A native of Sierra Leona. Mouth cylindrical, prominent; body narrower before, and very wide behind; antennæ ferrated.

Black; thorax orbicular, and with the elytra red, marked with an impressed black spot on the back. 44. A native of Europe.

Forty-four species.

36. HORIA.

Antennæ moniliform. Feelers four, thicker towards their outer side. Lip linear, rounded at the tip.

testacea. Reddish; antennæ and legs black. 1. A native of Tranquebar; the hind thigh of the male thickened, and grooved beneath, and marked with a little projection.

dermestoides. Reddish brown; eyes, wings, and breast black. 2. A native of Europe.

There are only two species of this genus described.

37. CUCUJUS.

Antennæ filiform. Feelers four, equal; the last articulation terminating abruptly, and thicker than the rest. Lip short, bifid; the divisions linear, and distant from one another. Body depressed.

muticus. Thorax unarmed, black, with an impressed dot on each side; elytra striated, brown. 2. A native of Europe; black.

testaceus. Of a brick colour; thorax nearly square, unarmed; thighs compressed. 3. A native of Europe, under the bark of the birch tree.

quadratus. Black; the thorax square, notched behind, marked with tubercles in the middle, and wrinkled on the external edge, clavated on the anterior part; the antennæ brown; the legs and elytra simple and reddish. A native of Europe.

Eleven species of this genus have been described in the last edition of the System of Nature.

38. CANTHARIS.

Antennæ filiform. Thorax (for the most part) marginated, and shorter than the head. Elytra flexible. Sides of the abdomen edged with folded papillæ.

* *Feelers four, hatched-shaped.*

This is an extremely rapacious genus, preying on other insects; and even on its own tribe; those of the division *lymexylon* only, both in the grub and perfect state, feed on green wood.

* *fusca.* Thorax red, with a black spot; elytra brown. 2. A native of Europe; in hedges; most rapacious, and devouring its own species.

marginella. Reddish; the abdomen black and marginated; the back part of the head, eyes, and breast yellow. 73. A native of Europe.

media. Brown; the thorax, head, base of the antennæ, the sides and tip of the abdomen, and the legs reddish. 14. A native of Europe.

hamatostoma. Black; mouth and abdomen red. 75. A native of Europe.

biguttata. The middle of the thorax black; the elytra shortened, black and yellow at the tip. 11. A native of Europe; in groves and gardens.

cardiaca. The thorax somewhat marginated; body black; antennæ pectinated; the elytra marked with a blood-coloured dot at the tip. 13. A native of Europe; on the *leonurus cardiaca*.

bistris. Black; the thorax, the base of the antennæ, pos-

terior base of the segments of the abdomen, and legs yellow, with a brown spot on the thorax. 82. A native of Europe.

** *Feelers filiform, the last articulation setaceous.* Malachii.

Bright greenish yellow; the upper surface of the elytra red. 7. A native of Europe; on plants. It is furnished with two tentacula at the base of the abdomen, of a blood colour, blunt, and connected at the base; likewise two on the thorax which can be stretched out. There is a smaller variety, with the elytra wholly of a blood colour.

Bright yellowish green; the elytra red at the tips. * *bipustulata.* 8. A native of Europe.

Black; the thorax and tips of the elytra red. 86. *hameroidales.* A native of Europe.

Thorax red, emarginated; elytra blue and smooth; antennæ and legs black. 63. A native of France; when des. touched under the breast, it contracts its head and body; when set at liberty it runs off very quickly.

*** *The anterior feelers stretched out; the last articulation but one, is enlarged with a large oval split appendage; the last articulation arched, and acute.* Lymexylon.

Black; the elytra light brown, and black at the tip; *proboscis* the feelers hooked, and irregular. 69. A native of Europe; in timber.

Brown; the antennæ and shanks of the legs black. *barbata.* 70. A native of Europe; in timber; covered with glossy down of a changeable hue; antennæ and legs paler.

The thorax somewhat tapering; body yellow; the margin and tips of the elytra black. 26. A native of Europe; in the timber of the oak, to which it is very destructive.

Eighty-six species of this genus have been described in the last edition of the System of Nature.

39. SERROPALPUS.

Antennæ setaceous. Feelers four, unequal; the anterior one longer than the rest, and deeply ferrated; four articulations, the last one very large, terminating abruptly, compressed, and like a plate; the posterior ones nearly clavated. Thorax marginated, the anterior one receiving the head, with a prominent angle on each side. Head bent down. Legs formed for digging.

Body brown; the elytra striated. A native of the island of Rumsala; found on old wooden buildings in autumn.

Body black; the elytra smooth. 2. A native of Europe.

40. ELATER, Skipper.

Antennæ filiform. Feelers four, hatchet-shaped. Under side of the thorax terminating in an elastic spine, coming out from a cavity of the abdomen; by which means the body, when placed on the back, springs up and recovers its natural posture.

Brown;

- flabellicornis*. Brown; antennæ with a fan-shaped tuft of eight large black leaves. 1. A native of India. This is one of the largest of the genus; the antennæ short.
- noctilucus*. Sides of the thorax marked with a smooth yellow spot. 4. A native of America. This insect, like the *lampyris* and *fulgora*, affords a strong phosphoric light in the night time, the streams of which are so strong, that a person may see to read the smallest print. When placed on its back, it will spring four or five inches from the level on which it is put, to recover its natural position; the abdomen when removed from the body is luminous internally.
- phosphoreus*. Brown; the thorax marked on its posterior part with two smooth yellow spots. 5. A native of South America, resembling the *noctiluca* very much, but only half the size, although considerably larger than the species to be found in Europe; the spots of the thorax shine in the night like the preceding species.
- bipustulata*. Black, shining; the elytra marked with a black dot at the base. 9. A native of Europe, on pasture grounds.
- * *brunnius*. The thorax reddish, and black in the middle; the elytra and body of a rusty colour. 10. A native of Europe; in gardens.
- * *cruciatus*. The thorax black, rusty-coloured on the sides; the elytra yellow, marked with a black cross, and black on the edges. 12. A native of Europe; on pasture grounds.
- * *ruficollis*. Black; the hind part of the thorax red, and shining. 14. A native of Europe; on grass land.
- mesomelos*. The thorax and edge of the elytra of a rusty colour; body and elytra black. 16. A native of Europe; larva six-footed, filiform, and hardish, furnished with a horny shield at the tail, notched at the sides, and furnished beneath with a conical hollow tubercle in form of a leg on the under side. It is common in decayed wood.
- * *aterrimus*. Thorax black and shining; the elytra striated and black. 17. A native of Europe.
- * *castaneus*. The thorax reddish and downy; the elytra yellow, and black at the tip. 13. A native of Europe; in low grounds.
- * *sanguineus*. Black; elytra of a blood colour. 21. A native of Europe; in grass lands. The tip of the elytra black.—A larger variety is found with the thorax downy and tawny; the elytra of a deep colour, and marked with a faint black blotch at the base.
- segetis*. Black; the antennæ and feet brown; the elytra marked with longitudinal black and brown lines. 114. A native of Europe; at the roots of corn. The larva destroys the fields, especially in dry seasons; it is a long time before it undergoes its metamorphosis.
- funereus*. Reddish; the elytra striated; head brown. 144. A native of Europe.
- * *obscurus*. Of a rusty colour; head and thorax brown, the latter, together with the elytra and legs, are of a brick colour. 146. A native of Europe.

149 species of this genus have been described in the last edition of the System of Nature.

CICINDELA, the Sparkler.

Antennæ setaceous. Feelers six, filiform; the posterior ones hairy. The jaws prominent and many-toothed. Eyes prominent. Thorax rounded and marginated.

* *Lip divided into three little projections.*

This is, in general, a very beautiful genus of insects; they are found in dry sandy places, and prey with the most ravenous ferocity upon all other insects which come in their way, and which they can overcome. The larva is soft, white, long, and has six feet, with a brown scaly head; and lurks in a round perpendicular hole in the ground, with its head at the entrance, to draw in, and devour whatever insects may come near, or fall into it.

Green; the elytra marked with five white dots. 1. * *campes-*
A native of Europe; in sandy plains. The upper part *tris*. of the antennæ brown, the under part red; thorax a little angular, rough; elytra irregularly dotted; upper lip white; jaws projecting, sharp; legs red, with a coppery tinge.

Purple; the elytra marked with a white band, and * *hybrida*. two white circular dots. 2. A native of Europe; in sandy places.

Of a copper colour; the elytra green, marked with a *germanica* white spot, like a crescent, at the tip. 4. A native of Europe. It varies in colour, being sometimes blue, green, or black.

Black, above bright brown; the elytra with lateral *danica*. striae at a good distance from one another. 40. A native of Europe.

Black, on the upper part nearly of the colour of *punctata*. brass; the elytra striated, marked with four impressed dots; legs a yellowish brown. 41. A native of Europe.

Of a rusty colour; legs, elytra, head, and thorax *ferruginea* reddish; the latter green behind; the elytra are marked with a waved green band, and have a green suture. 49. A native of Europe; in water. Head two-lobed behind; lip white; thorax jagged on the fore part; it has no scutellum; elytra with each 15 punctured striae, and three spots at the base near the anterior margin.

** *Lip rounded, pointed, entire.* Elaphrus.

Of a bright greenish yellow; the elytra marked with * *riparia*. broad concave points. 10. A native of Europe; in moist places.

Of an obscure brass colour; the elytra somewhat * *flavipes*. cloudy, legs yellow. 11. A native of Europe; on banks. The elytra are sometimes dotted; antennæ black, the first joint yellow; thorax rounded, and grooved on the back.

Black; the elytra brown, marked with two pale *quadrima-* spots, the shanks of the legs reddish. 13. A native *culata*. of Europe.

Of a bright brass colour, polished; head striated. * *aquatica*. 14. A native of Europe; common in water.

48 species of this genus have been described in the last edition of the System of Nature.

42. BUPRESTIS, the Cow-burner.

Antennæ filiform, ferrated, and of the same length with the thorax. Feelers four, filiform; the last articulation obtuse and terminating abruptly. Head half drawn back within the thorax.

This is a genus remarkable for its rich metallic colours,

lours, having frequently the appearance of the most highly polished gold or copper; the larvæ are usually found among timber, and in decayed trees.

vittata. The elytra dotted, and furnished with two little projections; they are likewise marked with four elevated lines, and with a broad fillet of green and gold. 33. A native of India.

fastuosa. The elytra terminating abruptly, furnished with two small projections, green, and marked with dotted striæ; the back is of a bright golden colour. 34. A native of America.

berolinensis. The elytra variegated with green and black, and furnished with two small projections; the anus is furnished with three small projections. 36. A native of Europe.

ocloguttata. The elytra formed like the roof of a house, and destitute of projections, marked with four white spots; body blue. 2. A native of Europe; in groves.

maculosa. The elytra black, striated, furnished with projections, and terminating abruptly, marked with four yellow spots. 50. A native of Europe; of a middle size. Head and abdomen green and gold; the legs and thorax black; the edge of the latter yellow.

mariana. The elytra are ferrated, and marked with longitudinal wrinkles, likewise with two impressed spots; the thorax furrowed. 6. A native of Europe.

* *chryso-stigma*. The elytra are ferrated, marked with two golden impressed spots, and longitudinal furrows; the thorax dotted. 7. A native of Europe.

* *rustica*. The elytra formed like the roof of a house, and striated; the thorax dotted. 8. A native of Europe; in groves.

* *salicis*. Shining green; the elytra entire, of a golden colour, and green at the base. 85. A native of Europe; on the willow.

120 species of this genus have been described in the last edition of the System of Nature.

43. HYDROPHILUS.

Antennæ clavated; the club perforated. Feelers four, filiform. The hind-legs hairy, formed for swimming, and almost destitute of nails or claws.

The insects of this and the next genus, *dytiscus*, are inhabitants of ponds and stagnant waters, where they swim with much dexterity, turning round with great velocity. They fly abroad by night in search of other waters. The males are distinguished from the females, by having a horny concave flap or shield on the fore-legs, near the setting-on of the feet; the hind-legs are peculiarly fitted for their aquatic situation, being furnished on the inner side with a series of long and close-set filaments, resembling a fin, by which they are enabled to swim with great ease and celerity. The larvæ remain about two years and a half before they change into pupæ, forming a convenient cell, and secreting themselves in some bank; are extremely voracious and destructive to the more tender aquatic insects, worms, and young fish, which they ravenously seize with their forked jaws, and destroy by sucking out their juice.

* *piceus*. *Water-clock*. Black; breast grooved, with a long spine pointing backwards. 1. A native of Europe.

The larva appears to have its legs seated on the upper part of the body near the back; but this is occasioned by the peculiar shape and position of the legs; the female spins a flattish circular web, terminated by a long tapering horn, from which the young escape, as soon as they are hatched.

Black, shining; the elytra somewhat striated. 2. A * *caraboides*.

Black, shining; the edges of the thorax and elytra yellow. 3. A native of Europe. Feelers filiform. * *scaraboides*.

Oval, black; the elytra and legs gray. 11. A * *minutus*. native of Europe. It makes a buzzing noise in the evening. Thorax is sometimes gray.

Black, shining above, and thickly dotted. 13. *Apilula*. native of Europe.

Twenty species of this genus have been described in the last edition of the System of Nature.

44. DYTISCUS.

Antennæ setaceous. Feelers six, filiform. The hind-legs hairy, almost entirely destitute of claws or nails, and formed for swimming.

Black; the edges of the elytra dilated, marked with * *latissimi* a yellow line. 6. A native of Europe. It is so voracious as even to destroy its own species. The male is smooth, the female grooved.

Black; the whole of the edge of the thorax, and the * *marginata* outer edge of the elytra, yellow. 7. A native of Europe. The fore-feet of the male have a hemispherical appendage, with two circular cavities in the middle. The female is semifriated.

Brown; the elytra hairy, marked with ten furrows, * *semistriata* reaching half their length. 8. A native of Europe. It is furnished with a sharp crooked concealed sword. Its eggs are oblong, large, and white.

The elytra marked with ten longitudinal furrows, * *fulcatus*, and are hairy. 3. A native of Europe and America. The elytra of the male are smooth.

Brown; thorax yellow, marked with four black dots. *notatus*. 31. A native of Europe. The thorax is sometimes reddish, sometimes variegated with black dots, or with a short black band.

The thorax of a rusty colour, marked with two black *depressus*. dots at the base; the elytra brown, spotted with red. 32. A native of Europe.

Brown; the elytra smooth; the legs and belly of a * *glaber*. rusty colour. 86. A native of Britain; in stagnant waters.

Bluish, clouded with black; the antennæ and legs of * *nebulosus* a rusty colour; the belly black, the margin of a light-brown colour. 87. A native of Britain; in stagnant waters.

133 species of this genus have been described in the last edition of the System of Nature.

45. CARABUS, Bull-head.

Antennæ filiform. Feelers six; the last articulation obtuse, and terminating abruptly. Thorax heart-shaped; smaller end which terminates abruptly being next the body. Both thorax and elytra are marginated.

These insects are exceedingly active and quick in running: they devour the larvæ of other insects, and all the weaker animals they can overcome; the legs are long.

long, thighs compressed, flanks rounded and ciliated within; the fore ones prickly before; the larvæ are found under ground or in decayed wood.

* *Majores.*

coriaceus. Black, opaque; without wings; the elytra connected and marked with dots which run into one another, and somewhat wrinkled. 1. A native of Europe; in woods. One of the largest species in Europe; head and thorax irregularly dotted; body beneath shining.

* *gratulatorius.* Without wings, and blackish; the elytra of the colour of brass, striated, and marked with elevated dots, placed between the striæ. 2. A native of Europe; in fields.

* *hortensis.* Without wings; black, the elytra smooth, marked with a triple row of bright yellow depressed dots, and with a blue edge. 3. A native of Europe; in gardens and woods. The dots on the elytra are sometimes of the same colour with the elytra.

arvensis. Without wings, and of a blackish copper colour; the elytra striated, and marked with a triple row of concave dots. 4. A native of Europe.

* *nitens.* Without wings; the elytra rough, green, with longitudinal raised lines, the edge golden; legs black. 6. A native of Europe; in woods.

* *auratus.* Without wings; the elytra gilt, and marked with elevated ridges and smooth furrows. 7. A native of Europe; in close confined places in woods.

violaceus. Winged; the elytra somewhat smooth, black, with a gilt edge; the thorax of a violet colour. 8. A native of Europe; very common in woods.

* *sycophanta.* Shining golden colour; the thorax blue; the elytra marked with strips of green and gold. 12. A native of Europe. This is the largest of this genus that is to be met with in Europe; the larva is black, it attacks caterpillars by night, and devours them.

adpersus. Without wings; above of an obscure greenish yellow; beneath black; the elytra marked with four rows of concave spots, and with furrows. 82. A native of Europe; in woods, under ground. The elytra are sometimes black.

** *Minores.*

sabulosus. Pale; the head black, and a black spot in the elytra. 96. A native of Europe; in sandy grounds.

* *ruficornis.* Black; the elytra smooth, and furrowed, the antennæ and legs reddish. 97. A native of Europe; in woods frequently.

* *pilicornis.* The thorax roundish; the elytra striated, and marked with impressed dots; the antennæ hairy. 104. A native of Britain. It is sometimes black, sometimes of a bright yellow.

* *spinibarbis.* Blue; the thorax spherical; mouth, antennæ, and flanks of the legs reddish. 105. A native of England.

crepitans. The thorax, head, and legs, of a rusty colour; the elytra black. 13. A native of Europe; in groves. It pursues the larger beetles, driving them away by the noise made by its belly.

280 species of this genus have been described in the last edition of the System of Nature.

46. TENEBRIO.

Antennæ moniliform; the last articulation roundish. Thorax flat on one side, and convex on the other,

and margined. Head projecting. Elytra somewhat rigid.

* *Feelers six, filiform; the Fore-legs formed for digging, furnished with projections at the extremity like a hand.*

The larvæ of some of the species of this genus live in damp places under ground among rubbish; of others in flour and different kinds of food, where they perform their metamorphosis. The perfect insects are very troublesome in houses, eating bread, meal &c.; they precipitately avoid the light; resort to damp cellars, and dark places, where putrefaction allures and nourishes them. They are all of a very dark gloomy appearance, from which circumstance they have received their name.

Black; thorax nearly square; the elytra very smooth. *complanatus.* 13. A native of Cayenne; large.

Black. 7. A native of Europe; on sand hills, in *fosfor.* which it digs holes.

Brown; thorax oblong, marked with five projecting *cursor.* angles. 8. A native of Europe; in sand hills.

** *Feelers unequal; filiform.*

Wholly black, and smooth. 21. A native of *E-attratus.* Egypt; the elytra joined together, the fore legs furnished with two projections.

*** *Feelers four; the anterior ones faintly clavated, the posterior ones filiform.*

Black; the thorax nearly square and smooth; the *laminatus.* elytra furrowed; the flanks of the fore legs crooked and sharp, terminating in a rusty-coloured plate. 22. A native of India; the largest of the genus.

Black; the elytra striated; thorax smooth. 1. *Agigas.* native of Surinam, about the size of the stag-beetle; the antennæ are somewhat clavated.

Wholly black; the thighs of the fore legs thicker *molitor.* than those of the rest. 2. A native of Europe; among flour, in bake-houses, mills, dry bread &c. The larva is white, soft, and smooth, composed of thirteen segments; it is eagerly sought after by the nightingales.

Of a rusty colour; the elytra striated, the shield *culinaris.* emarginated. A native of Europe; in loose sand, in rubbish, and in granaries.

Black above; beneath of a deeper and brighter black; *pomona.* the elytra marked with five elevated striæ on each side.

45. A native of Europe, in orchards; the larva covered with a loose net, by twos or threes lurk in the folded leaves.

The thorax marked with two cavities; the elytra of *lignarius.* a violet colour or reddish; the antennæ and legs of a rusty colour. 57. A native of Europe. The larva is to be met with in the trunks of pine trees that have been cut down, the inner bark of which they consume; the insect is, when full grown, about half an inch long.

64 species of this genus have been described in the last edition of the System of Nature.

47. PIMELIA.

Antennæ filiform. Feelers four. Thorax flat on one side, and convex on the other and margined. Head projecting.

jecting. Elytra slightly ridged. Wings are wanting in many of the species.

* *Antennæ moniliform towards their extremity.*

A. *Feelers clavated.*

gages. Black; thorax roundish; the elytra sharp pointed and very smooth. 1. A native of Europe.

fulcata. The elytra furnished with sharp points, and furrowed. 2. A native of Egypt; common in gardens. They are recommended as remedies in the earache, and against the bite of scorpions; the Turkish women dress and eat them, and think them very fattening.

* *mortifaga.* Black; the elytra are furnished with sharp points, and smooth. 3. A native of Europe; in shady close situations. This insect is regarded as a presage of the death of one of the family, by the common people in Sweden, when it is seen crawling about the house.

B. *Feelers filiform.*

muricata. Black; the elytra obtuse, striated, and furnished with sharp points. 20. A native of Europe, and the northern parts of Africa and Asia; it makes a noise by rubbing its hind legs against its elytra; it resembles the *mortifaga*, but larger.

striatula. Black; the elytra oblong, oval, and striated. 54. A native of Europe.

** *The Antennæ filiform through their whole length.*

A. *Feelers four, filiform.*

tricuspidata. The thorax furnished with three sharp points; body gray. 56. A native of Egypt.

B. *The anterior feelers hatchet-shaped, the posterior ones clavated.*

cærulea. Bluish; the thorax nearly round, the elytra striated. 61. A native of Europe.

* *anglica.* Black; the thorax roundish before; the elytra dotted and striated; the antennæ reddish at the tips. 76. A native of England.

buparia. Black; smooth and furnished with wings; the thorax circular; the jaws strong, furnished with teeth, and longer than the head. 84. A native of Europe.

84 species of this genus have been described in the last edition of the System of Nature.

48. MANTICORA.

Antennæ filiform. The articulations cylindrical. Feelers four, filiform. Thorax roundish before, and emarginated at the tip behind. Head projecting. Jaws projecting. Elytra united. No wings.

maxillofa. 1. A native of the Cape of Good Hope; body large, black; head nearly globular, and impressed on each side; jaws furnished with teeth at the base; thorax impressed in the middle, and clavated behind, the margin rounded and notched at the tip; elytra above, flat and rough, deflected at the edge with a very sharp lateral serrated line; legs simple, black.

Only one species of this genus has been described.

49. ERODIUS.

Antennæ moniliform. Feelers four, filiform. Jaw horny, bifid, and ending abruptly. Lip horny, emarginated.

estudinarius. Hunch-backed, black; the elytra united and rough; the sides dusky white. 1. A native of the Cape of Good Hope; large, flat beneath.

VOL. VIII. Part I.

Hunch-backed, black; the elytra marked with three *gibbus*. dotted lines. 2. A native of Africa; in loose sand, and very common in Egypt.

Black; the elytra marked with one clavated line. *planus*.

3. A native of Egypt.

Black; the elytra very smooth. 4. A native of Asia. *minutus*.

Only four species of this genus have been described.

50. LYTTA.

Antennæ filiform. Feelers four, unequal; the posterior pair clavated. Thorax roundish. Head inflected, and turgid on the upper side. Elytra soft, and flexible.

Green; the antennæ black. 1. A native of Europe; on the privet, the ash, the elder, the lilach both common and Persian, the poplar, and on the Tartarian woodbine.

This insect is used in pharmacy, chiefly for the purpose of raising blisters. It multiplies greatly, and has a nauseous smell, not much unlike that of mice; which helps to conduct those who go in quest of them. The odorous particles exhaled from them are extremely corrosive. They were formerly ranked among the *cantharides*; more recently in the genus *meloë*. More accurate observation has placed them in the genus *lytta*.

Green and gold; the elytra reddish brown. 2. A *nitidula*. native of England.

Black, smooth; breast downy; the elytra grayish yellow, marked with two black and almost square spots. *culata*.

14. A native of the north of Asia. A pleasant smelling oil exfudes from its legs.

Smooth, pale reddish brown; thorax depressed; the elytra gray, and black at the tips, and marked with two square glazed spots. 15. A native of the north of Asia, among flowers; of a middle size. A pleasant smelling oil is likewise exfuded from its legs.

Brown; the fore part of the elytra, and the thorax, *formicaria*. which are elongated, are red. 29. A native of Europe.

29 species of this genus have been described in the last edition of the System of Nature.

51. MELOE, the Blossom-eater.

Antennæ moniliform. Thorax roundish. Elytra soft, and flexible. Head inflated, and turgid on the upper side.

The larva as well as the perfect insect, both of this and the preceding genus, feed on leaves.

* *No Wings; Elytra shortened.*

Body of a violet colour. 1. A native of Europe. *proscara*. It is to be met with, particularly in the spring, in sandy *bæus*. plains. They feed on the ranunculus and veratrum; its eggs have a pleasant smell; when touched, a very thin yellowish oil exfudes from the joints of its legs. It is recommended as a remedy in the hydrophobia. The female is thrice as large as the male.

The segments of the abdomen red. 2. A native *majalis*. of the south of Europe.

* *Furnished with Wings; the Elytra covering the Wings.*

A. *Jaw bifid.*

Black; the elytra yellow, marked with three black *cichorei*. bands.

bands. 5. A native of Asia, and the east of Europe. It is used in medicine among the Chinese. The antennæ are sometimes yellow at the tips.

docem-punctatus. Black; the elytra reddish, marked with five black dots. 6. A native of Italy. The last articulation of the antennæ clavated.

B. *Jaw entire.*

schæfferi. Green; the antennæ and legs yellow. 12. A native of Europe.

schreberi. Green; the antennæ, legs, and three segments of the abdomen, yellow.

32 species of this genus have been described in the last edition of the System of Nature.

52. MORDELLA, the Nibbler.

Antennæ moniliform or pectinated. Feelers four; the anterior pair clavated, the posterior filiform. Head bent down under the neck. Elytra bent downwards towards the lip. Before the thighs, and at the base of the abdomen, there is a broad plate.

* *Antennæ pectinated.*

paradoxa. The sides of the thorax, and the elytra, a brick colour. 1. A native of Europe; on umbelliferous plants.

flabellata. Reddish brown; mouth, breast, and upper part of the abdomen, black. 10. A native of Europe.

** *Antennæ moniliform.*

bimaculata. Of a rusty colour; breast black; elytra reddish marked with a black spot. 13. A native of Europe. Large.

* *aculeata.* Black; the anus terminating in a spine. 2. A native of Europe; on umbelliferous, and a variety of other plants.

* *abdominalis.* Black; thorax and abdomen tawny; the anus terminating in a spine. 19. A native of Europe.

* *humeralis.* Black; the mouth, sides of the thorax, and legs yellow. 3. A native of Europe; on flowers.

* *bicolor.* Black; the elytra reddish, black at the tip, and marked with a black band in the middle. 25. A native of Britain; very common on the flowers of the hawthorn, of the dock, and of some kinds of umbelliferous plants. Very small.

*** *Antennæ clavated.*

* *clavicornis.* Wholly black. 23. A native of Europe; on the rhubarb.

28 species of this genus have been described in the last edition of the System of Nature.

53. STAPHYLINUS, Rose-beetle.

Antennæ moniliform. Feelers four. Elytra half the length of the body. Wings covered. Tail simple, furnished with two vesicles, which can be thrust out at pleasure.

This is an extremely rapacious tribe, devouring whatever insects they can catch, and frequently each other; many of them, when laid hold of, turn up the tail; the jaws are strong and projecting, with which they bite and pinch very hard. Most of them are found in damp places, among putrid substances, and a few upon flowers. The larvæ live under ground.

* *All the Feelers filiform.*

Hairy, black; the thorax and posterior part of the abdomen black. 1. A native of Europe; in sandy places.

Downy, and ash coloured, clouded with black. 2. * *murinus.* A native of Europe; in dead bodies, and in dung. The elytra blue underneath; larva six-footed, naked, pale; the head and three first segments of the abdomen chestnut brown; tail with two jointed bristles, and a cylindrical tubercle beneath.

Downy black; marked with ash-coloured bands; the jaws of the same length with the head. 3. A native of Europe; in woods, living on plunder.

Black; the thorax and elytra shining. 5. A native of Europe; on dead bodies; when recently caught, it diffuses a very fragrant smell.

Black; the edges of the thorax yellowish; the elytra of a rusty colour, with a black edge. 4. A native of Britain.

** *The posterior Feelers hatchet-shaped.*

Reddish; the head, posterior part of the elytra and abdomen, as well as the base of the thighs, black. 6. A native of Europe; on the *boletus*.

Black; the elytra, antennæ, and legs of a rusty colour. 22. A native of Europe; on the *boletus*.

*** *The anterior Feelers clavated.*

Reddish; the elytra blue; the head and tip of the abdomen black. 9. A native of Europe.

Black; thorax reddish; the elytra pale blue. 96. A native of Europe; under stones.

Black; the posterior part of the elytra, the legs and antennæ, of a rusty colour. 14. A native of Europe.

56. FORFICULA, the Earwig.

Antennæ setaceous. Feelers unequal and filiform. Elytra half the length of the body. Wings covered. Tail furnished with pincers.

The larvæ of the forficula run very quickly. This insect is very common, and very well known; the pincers at its tail, from whence it has received its Latin name *forficula*, afford a very good distinguishing mark.

The elytra white at the tip; the antennæ have fourteen articulations. 1. A native of Europe; common in fruit. It is accused of creeping into the ears of people while sleeping, whence it has received its name, *earwig*.

Pale above, variegated with black; the anus furnished with two projections; the pincers projecting considerably, and each furnished with one projection. 3. A native of Europe. Very large.

The elytra reddish, without spots; the antennæ have ten joints. 2. A native of Europe. The tips of the antennæ are whitish. It is rare.

Black; the hind-part of the head and legs reddish; back of the elytra marked with a white spot. 4. A native of Europe. The antennæ have eleven joints.

11 species of this genus have been described in the last edition of the System of Nature.

II. HEMIPTERA,

II. HEMIPTERA.

THE mouth and snout bent inwards, towards the breast. Wings covered with hemelytrae. The upper wings, composed of a semicrustaceous substance, do not form a straight suture when shut, but the inferior edge of the one passes over the superior edge of the other.

55. BLATTA, *Cock-roach*.

Head bent inwards. Antennæ setaceous. Feelers unequal, filiform. Elytra and wings smooth, and somewhat resembling leather. Thorax flatish, circular, and marginated. Feet formed for running. Two small horns are situated at the tail in most of the species.

These insects, with their larvæ, wander about by night, and secrete themselves by day. They are fond of varnith, and haunt about houses, devouring meal, and whatever provisions they can get at. They run with great celerity; and are destroyed by the fumes of charcoal or sulphur, also by the root of the *nymphaea alba* boiled in milk.

gigantea. Livid; the shield of the thorax marked with a square chestnut-coloured spot. 1. A native of Asia and America. It is the largest of this genus, being nearly the size of a hen's egg.

maderæ. Brown; the thorax and elytra livid, and variegated with brown. 11. A native of the island of Madeira; a little smaller than the last species.

* *americana*. Of a rusty colour; the shield of the thorax whitish behind. 4. A native of America; it has been introduced into Europe along with sugar.

australasica. Of a rusty colour; the thorax black, marked with a white ring; the elytra marked at the base with a small white line. 13. Found in ships returning from the south seas.

* *orientalis*. Of a rusty brown colour, without spots; the elytra short, marked with an oblong furrow. 7. A native of America, and has been introduced into Europe for almost two hundred years. Frequent in many countries of Europe, in meal and bread, and other provisions; likewise in shoes, which it destroys. It shuns the light, and runs very quickly. It is much harassed by the large *tenthredo carulea*. The female is without wings; she produces a cylindrical egg, half the size of the abdomen.

lapponica. Yellowish; the elytra spotted with black. 3. A native of Europe; consuming provisions. In the moist woods however of the east of Europe it is less noxious.

germanica. Livid; body yellowish; the thorax marked with two black parallel lines. 9. A native of Europe.

maculata. Thorax black, with a whitish edge; the elytra pale, marked with a large black spot near the tip. 25. A native of Europe; in pine forests and heaths.

43 species of this genus have been described in the last edition of the System of Nature.

56. PNEUMORA.

Body oval, inflated, and transparent. Head bent inwards, and furnished with jaws. Thorax convex, beneath formed like a keel of a ship. Elytra deflected and membranaceous. Legs formed for running.

The whole of this genus seem to consist of a mere hollow inflated membrane; by rubbing their legs against their bodies, they make a shrill noise in the twilight; and during the night, they are attracted by a bright light.

Elytra without spots. 1. A native of the Cape of Good Hope. Head green; eyes white; between the eyes are three red stigmata, and above these two short projections; antennæ short, green; thorax rough, with a short tooth before and an impressed wrinkle in the middle; the elytra ash-coloured, reticulated with green, sometimes marked with very small black dots; they are very rarely yellowish or reddish; the insect is about twice the size of the house-cricket.

Three species of this genus have been described in the last edition of the System of Nature.

15. MANTIS, *Soothsayer*.

Head nodding; furnished with jaws. Feelers filiform. Antennæ setaceous. Wings four, membranaceous, rolled up. Fore-legs compressed, notched underneath, furnished with one hook, and with a lateral setaceous jointed finger; the four hind-legs smooth, and formed for walking. Thorax linear, long, and narrow.

The thorax somewhat tapering and rough; the elytra very short; the legs prickly. 1. A native of Asia; wings very large.

Thorax marginated, and marked with small projections; the elytra variegated with green and white; dotted with white along the edge. 17. A native of Alexandria.

The thorax smooth; the elytra green; the wings reddish at the anterior part, marked with a black spot. 6. A native of Europe. This insect rests sometimes on its four hind-legs, stretches the fore-legs out to the right or left, and for this reason has been supposed to point out the way to strangers, when asked.

The thorax somewhat fringed; the elytra greenish, marked with a rusty-coloured ocellus. 8. A native of America and Africa; the half of the ocellus on the elytra is white, sometimes entirely white. This is supposed to be the idol of the Hottentots.

Linear, ash coloured, spotted with black. 30. A native of the Cape of Good Hope. This is the tutelary deity of the Hottentots.

52 species of this genus have been described in the last edition of the System of Nature.

58 GRYLUS, *Cricket*.

Head bent inwards; furnished with jaws. Feelers filiform. Antennæ either setaceous or filiform. Wings four, either deflected or twisted; the under wings folded. Hind-legs formed for leaping.

The whole of this genus feed on vegetables, except those contained in the first division, *acrida*, which devour other insects; the *acheta* destroy the roots of plants; the *tetigonia* and *locusta*, the leaves or tender shoots, in some countries laying waste whole districts; the larvæ and pupæ resemble the perfect insects, reside chiefly under ground, and are six footed, voracious and active: some of this tribe are used as an article of food by the natives of Africa and India; many of them produce sound by the friction of some parts of their body.

- * *Antennæ the shape of a sword; Head conic, and longer than the thorax.* Acridæ.
- nasutus.* Body green. 1.
turritus. Head conic; antennæ sword-shaped; the wing transparent. A native of Africa and the southern parts of Europe; the mouth placed at the under part of the head; antennæ on the top of the head, and not longer than the thorax.
- giganteus.* Green; marked with two reddish fillets; the antennæ of a rusty colour; thorax marked with three raised lines. 64. A native of America; larger than the *gr. nasutus*.
- foliaceus.* Wings yellowish; the antennæ resembling a leaf. 67. A native of Asia.
- ** *Thorax formed like a keel; Antennæ filiform, shorter than the thorax.* Bullæ.
- * *bipunctatus.* Brownish; the scutellum of the thorax, of the same length with the abdomen. 7. A native of Europe; on sand hills exposed to the sunshine.
- * *subulatus.* The scutellum longer than the abdomen. 3. A native of Europe; in ditches. It is sometimes gray, sometimes brown.
- *** *Antennæ setaceous; Feelers unequal; Thorax rounded; the Tail furnished with two bristles.*
- * *gryllotalpa.* *Mole-cricket.* The wings furnished with a projection like a tail, and longer than the elytra; the fore-feet formed like hands, and downy. 10. A native of Europe. This troublesome little animal frequents gardens and cultivated grounds, both of Europe and America, where it burrows below the ground, and is very destructive; eating and destroying the roots of plants. Body dark brown, hairy; antennæ shorter than the body.
- monstrosus.* The elytra and wings furnished with projections like tails, and rolled up. 73. A native of India.
- * *domesticus.* *House-cricket.* The wings furnished with a tail and longer than the elytra; legs simple; body yellowish brown. 12. A native of Europe; in many houses, about ovens, and kitchen chimneys: wanders about during the whole night, keeping a continual chirping, especially before rain; is said to forsake houses infested by the cockroach. There is a variety of this species six times the size of the European. Arsenic or the root of the wild carrot, mixed up into a paste with flour, is sometimes made use of to poison them; but an opinion prevails among the vulgar, that their presence in any house is the cause of good fortune; and, therefore, though they be troublesome, they are unwilling to drive them away.
- * *campestris.* *Field-cricket.* Wings shorter than the elytra; body black, and furnished with a long spine. 13. A native of Europe; chirps from the beginning of May till the end of September, and is said to drive away the house-cricket when domesticated.
- pellucens.* Whitish; thorax of the form of a trapezium. 85. A native of Carniola and Europe; in vineyards and gardens; about half an inch in length; it makes a noise during the whole summer in the night time; it resembles the house cricket, but larger; the head is shining; the thorax is marked with three brown spots, the elytra with yellowish ones.
- *** *Antennæ setaceous. Feelers unequal. Tail of the female armed with a projection like a sword.* Tetigonæ.
- The thorax round, and somewhat warty; wings very *aquilinus*. broad; with 15 nerves. 27. A native of South America and India; large; the elytra of the shape of a lance; the shanks of the legs set with four rows of prickles.
- Brown; the thorax roundish and keel-shaped *be-grifcus*. hind, furnished with a black crooked spine resembling a sword, the base of which is pale on each side. 108. A native of Europe; the antennæ yellow, and of the same length with the body; legs greenish; the elytra variegated with brown and ash-colour.
- The thorax round; the wings green and without *viridifl-* spots; the antennæ very long. 31. A native of *mus*. Europe; on trees, in pasture grounds, in barley fields. It makes a noise in the night time in warm weather about the time of the dog days.
- Thorax nearly square and smooth; the wings green, * *verrucif-* spotted with brown; the antennæ setaceous, about the *vorus*. same length of the body. 34. A native of Europe, and is collected by the common people of Sweden for the purpose of destroying warts in the hand; which it is said to perform by biting off the excrescences, and discharging on the wound a fluid which causes them to decay.
- ***** *Antennæ filiform, Feelers simple, Tail unarmed.* Locustæ.
- The thorax entirely keel-shaped; body without wings. *elephas*. 35. A native of Africa; this is the largest and heaviest of the *Locustæ*; green, the thighs smooth, the rudiments of two wings.
- The thorax faintly carinated, composed of one seg- *migra-* ment; head obtuse; jaws black. 41. A native of *torius*. Tartary, and migrates in incredible swarms into various parts of Europe. The mischief these voracious creatures do, when they appear in vast swarms, far exceeds that done by any other tribe of animals. By suddenly destroying all vegetation, they change the most fertile countries into barren deserts, leaving behind them desolation and famine. They have occasionally appeared in small flights in England, but have perished in a short time. This was probably the species that constituted one of the plagues of Egypt. They are eaten by the inhabitants of different countries, particularly by the Egyptians, who roast them alive and eat their bodies, after having removed their wings and legs.
- The thorax marked with an elevated ridge like a * *stridulus*. keel, the wings red and black at the tips. 47. A native of Europe; in dry sandy situations, chirping all day long, till late at night. Either black or variegated with black and yellow.
- 240 species of this genus have been described.
59. FULGORA, *Lanthorn-fly.*
- The head inflated; fore head prominent. The antennæ short, placed under the eyes, composed of two articulations, the upper one being the largest and globular.

globular. The snout long and bent inwards, is a sheath consisting of five articulations. Legs formed for walking.

lanterna-ria. The forehead extended, forming a straight beak; wings bluish, the under wings marked with ocelli. 1. A native of South America. It emits a very bright light from the prominent part on its forehead. Travellers are said to avail themselves of the light they emit; two or three of them, fixed on the end of a stick, affording light sufficient to let them see in the dark.

diadema. The forehead set with tapering points, and extended into a beak, divided at the tip into three; wings black, spotted with red. 2. A native of India.

candelaria. The forehead extended into a clavated beak; the elytra green, spotted with yellow; the wings yellow with black tips. 3. A native of China.

phosphorea. The forehead raised into a tapering beak; body grayish yellow. 4. A native of South America.

hyalina. The forehead conic and unequal; wings transparent, marked with a black streak. 17. A native of Bengal.

20 species of this genus have been described in the last edition of the System of Nature.

60. CICADA, Frog-hopper.

Snout bent inwards. Antennæ setaceous. Wings four; membranaceous and destitute. Legs, (in the most of the species) are formed for leaping.

The insects of this genus feed on the juice of plants; the larva is without wings; the pupa has only the rudiments of wings, but they have both six legs; they very much resemble the perfect insect, and are very active; the perfect insect chirps as well as those of the preceding genus.

* Antennæ tapering at the point, and placed on the forehead. Membracides.

A. Thorax compressed, membranaceous, and larger than the body. Foliaceæ.

inflata. The thorax inflated, light brown and reticulated. 52. A native of Cayenne.

* *genista.* The thorax brown; lengthened out behind, the abdomen being half the length of the thorax. 56. A native of England; on the *genista tinctoria*.

inermis. The thorax greenish, tapering to a point, and of the same length with the abdomen. 57. A native of America, on plants.

B. The thorax furnished with a horn on each side. Cruciatæ.

* *cornuta.* The thorax furnished with two horns; black, tapering to a point behind, and of the same length with the abdomen; wings brown. 6. A native of Europe; on thistles and willows.

** Legs not formed for leaping. Maniferæ.

plebeia. The tip of the scutellum marked with two small projections; the elytra marked with four anastomoses, and six lines of a rusty colour. 15. A native of Europe and Africa, very large. Of this insect Virgil says, *et cantu quærule rumpent, arbusta cicadæ, and sole sub ardente resonant arbusta cicadis*.

orni. Black, spotted with yellow; the elytra are surrounded with a thin edge, with six brown connected dots; the wings are white, marked with two black spots, and

yellow at the base. 16. A native of Europe; the larva is eatable.

*** Antennæ filiform, situated under the eyes.

A. The sheath of the snout stretched out, obtuse, and grooved above. Cercopides.

Yellowish; the elytra brown, marked with two white bands. 11. A native of Europe; on plants of different kinds.

Brown; the elytra are marked on the sides with two white spots, and with a double interrupted whitish band. 24. A native of Europe; on various plants, frequently on the rose, on grass and osier; the larvæ and pupæ of this, and some others of the genus, discharge a frothy matter from numerous pores about the tail, within which they are completely enclosed; this is frequently found in summer on various plants, very much resembling a quantity of saliva, and is commonly known by the name of *cuckow spit*; the perfect insect will frequently leap two or three yards to escape from any one who attempts to catch it.

Brown; the fore part of the thorax marked with im-pressed dots, the elytra marked on the sides with two white spots. 212. A native of Europe.

†† The sheath of the snout very short, membranaceous, cylindrical, obtuse.

* Legs formed for leaping. Ranatræ.

Brown; wings transparent, spotted with brown, and marked with dotted ribs. 25. A native of Europe; on plants.

Yellow; the elytra gilt and brown. 123. A native of Britain; on plants.

§§ The wings deflected, covering the sides. Deflexæ.

Yellow; the elytra marked with brown, with four black spots, and gilt behind. 48. A native of Europe.

Yellowish; the elytra marked with blood-coloured spots, and brown at the tips. 173. A native of Europe; on the oak.

240 species of this genus have been described in the last edition of the System of Nature.

61. NOTONECTA, Boat-fly.

Snout bent inwards. Antennæ shorter than the thorax. Wings four, folded cross-wise, the upper ones coriaceous. Hind legs hairy, formed for swimming.

The insects of this and the next genus, *Nepa*, live in stagnant waters, and prey on aquatic animals; the larvæ and pupæ are six-footed, active, and swim readily; and very much resemble the perfect insect; the larvæ is destitute of wings, the pupæ have only the rudiments of wings.

* Lip long.

The elytra gray, dotted with brown along the edge, and divided at the tip. 1. A native of Europe; in waters, very troublesome to fish. It swims on its back, for which reason it has been called by the Greek name of *notonecta*. The hind legs, which are longer than the rest, serve it as oars. When caught, it must be cautiously handled, as the point of its snout is very sharp, and its puncture very painful.

** No

** *No lip.* Sigaræ.

* *striata.* The elytra brown; marked with a great number of cross waved lines of a darker colour. 2. A native of Europe.

14 species of this genus have been described in the last edition of the System of Nature.

62. NEPA, *Water Scorpion.*

Snout bent inwards. Antennæ short. Wings four, folded cross-wise, the upper ones coriaceous. The fore-legs formed like claws; the other four are formed for walking.

The insects of this genus are very voracious, and feed on other aquatic animals, which they pierce and tear with their sharp snout, while they hold them with the claws of their fore-legs. They fly well, especially in the evening and night, and convey themselves from one pool to another, particularly when water begins to fail in the pool they have been in.

* *Antennæ divided into several divisions resembling a hand; Lip wanting.*

* *cinerea.* Ash-coloured; thorax unequal; body long and oval. 5. A native of Europe; in stagnant waters; the upper part of the abdomen red.

* *linearis.* Linear; the claws furnished with a lateral spine. 7. A native of Europe and India, in fresh water. The eggs of this insect are furnished at one end with two hairs; they deposit them in holes made in stalks of rushes, leaving the hairs standing out.

** *Lip stretched out and roundish.* Naucorides.

* *cimicoides.* The edge of the abdomen slightly notched. 6. A native of Europe.

Twelve species of this genus have been described in the last edition of the System of Nature.

63. CIMEX, *Bug.*

Snout bent inwards. Antennæ longer than the thorax. Wings four, folded cross-wise; the upper wings coriaceous in the fore part. Back flat. Thorax margined. Legs formed for running.

Most bugs have a bad smell; all of them except the *reduvi*, feed on the juice of plants, and all of them, without exception, on the juices of animals, particularly of the softer insects, which they suck by means of their snout. The larvæ and pupæ have six feet, run quickly, and very much resemble the perfect insect; the larvæ have no wings, only stumps of wings.

* *Antennæ placed before the Eyes.*

A. *Lip wanting.* Acanthiæ.

† *Without Wings.*

* *leucularius.* *House-bug.* Without wings. 1. A native of Europe, though originally a foreigner; it was introduced into Europe before the Christian era, but not into Britain until the seventeenth century, being little known before the year 1670. It is a troublesome and nauseous

inhabitant of most houses in large towns; crawling about in the night time to suck the blood of such as are asleep, and hiding itself by day in the most retired holes and crevices.

†† *The Elytra almost totally coriaceous.* Coleoprati.

Black; without wings; the elytra oval, with yellow *grylloides* edges, and shorter than the abdomen. 13. A native of Europe. The thorax resembling the *gryllus*.

††† *Membranaceous and very flat.*

The thorax divided into three wings; the scutellum * *pyri.* resembling a leaf; the elytra reticulated and swelling out at the base. 137. A native of Europe; on the under surface of the leaves of the pear tree, which become spotted with its punctures.

B. *Lip long, tapering to a point at the extremity.*

† *The Scutellum of the same length with the Abdomen.* Scutellati.

Black; the thorax marked with five, and the scutellum with three orange-coloured lines; the abdomen yellow, dotted with black. 6. There is a variety of this species.

(β) Red; the thorax marked with five, and the scutellum with three black lines; the abdomen yellow, dotted with black. A native of Europe; on the flowers of the apple and elder.

†† *The Thorax armed with a spine on each side.* Spinosi.

The thorax armed with blunt prickles; the elytra * *luridus.* gray, marked with a brown spot, the shield emarginated. 190. A native of England; in thickets.

††† *Thorax without spines.*

A. *Rotundati, such as are round or oval.*

Somewhat tawny, the edge of the abdomen spotted with brown. 45. A native of Europe; on berries. *rum.*

Blue, with a metallic lustre; the thorax marked with a small line; the tip of the scutellum, and dots on the elytra, all of a red or white colour. 53. A native of Europe; on tetradynamious plants. It is very destructive to cabbages and to turnip fields.

B. *Such as have the Thorax oblong.*

† *Antennæ terminating in small hairs.*

Black; head, thorax, and legs reddish. 364. A * *flavicolis.* native of England.

** *Antennæ clavated.*

Brown; head and thorax reddish. 679. A native of Europe. *ictericus.*

C. *Antennæ filiform.*

† *Legs smooth.*

Yellowish; elytra green. 36. A native of Europe; * *pratensis.* in meadows.

†† *Legs*

‡ ‡. *Legs notched or prickly.*

calcaratus. Brown; the upper part of the abdomen of a blood colour; the thighs of the hind-legs furnished with six sharp projections. 114. A native of Europe.

D. *Antennæ fetaceous.*

‡. *Legs notched.*

abietis. Spotted, with tawny coloured spots; legs reddish; thighs thick. 115. A native of Europe; on the fir tree.

‡ ‡. *Legs without prickles.*

patulinus. Green, without spots; wings transparent. 83. A native of Europe; in meadows.

§ § §. *Linear; Body oblong and narrow.*

|| *Antennæ fetaceous.*

pedes. Variegated, with brown and yellow; the thighs of the hind-legs long and notched. 524. A native of India.

||| *Antennæ filiform.*

* *flagnorum.* Black and tapering; the thorax marked in the centre with two globular dots. 113. A native of England; very common in lakes.

|||| *Antennæ clavated.*

trispinosus. Greenish brown; the antennæ long, with three erect prickles on the back. 542. A native of Surinam.

||||| *Antennæ double clavated.*

succicus. Ash-coloured; the thighs clavated. 543. A native of Europe.

|||||| *Antennæ with two terminations.*

tipularius. Whitish; all the legs very long; the thighs clavated. 120. A native of Europe; on mosses.

** *The Antennæ placed above the Eyes; the Snout arched.* Reduvii.

personatus. The antennæ resembling hairs at the tips; body somewhat hairy and brown. 67. A native of Europe; in rubbish. The larva is rough, and destroys the house-bug.

stridulus. Smooth, black; the elytra brown, spotted with black, and with a red edge. 557. A native of Europe. It is small, and moves about with great agility early in the spring; it keeps its antennæ in constant motion, and makes a shrill noise by rubbing them against the thorax.

693 species of this genus have been described in the last edition of the System of Nature.

54. MACROCEPHALUS.

Snout bent inwards. Sheath of one valve, and consisting of three articulations, and furnished with three bristles, destitute of jaws, feelers, and lip. Antennæ

stretched forwards, very short, clavated, and nearly moniliform. Head oblong, cylindrical above. Scutellum of the length of the abdomen, flat and membranaceous.

A grayish-reddish colour; the scutellum of an ash-cimicoides colour; a yellow spot on the elytra; the wings of a purplish violet colour; the thighs of the fore-legs thickened. 1. A native of America.

Only one species of this genus has been described in the last edition of the System of Nature.

65. APHIS, *Plant-louse* or *Vine-fretter*.

Snout bent inwards; a sheath of five joints, furnished with one bristle. Antennæ fetaceous, and longer than the thorax. Wings four, erect in none. Legs formed for walking. Abdomen frequently terminating in two horns.

The minute animals which compose this singular genus, infest various plants, generally in large societies, hindering their growth, and consuming their juices. A peculiarity in the mode of their propagation attracted the attention of naturalists a good deal towards the beginning and about the middle of last century. Reaumur, from some observations of his own, and from the opinions of some preceding observers, was led to believe, that they propagated without sexual connection. Bonnet adopted the same opinion, and thought he had established it beyond controversy by some very accurate experiments and observations of his own, which he communicated to the Royal Academy of Sciences. He shut up a young aphid, at the instant of its birth, in the most perfect solitude, which nevertheless brought forth 95 young ones in his sight. The same experiment being repeated on one of this family, it multiplied like its parent; and one of this third generation, brought up in solitude, proved no less fruitful than the others. Repeated experiments, in this respect, as far as the fifth or sixth generation, all uniformly afforded the same result. A suspicion entertained by Mr Trembley induced Mr Bonnet to repeat his experiments with still more accuracy, and to continue them longer. He reared to the amount of the tenth generation of solitary aphides, and had the patience to keep an account of the days and hours of the births of each generation: he discovered, that they are really distinguished by sexes; that the males are produced only in the tenth generation, and are but few in number; that these soon arrive at their full growth, and copulate with the females; that the virtue of this copulation serves for ten generations: he likewise found that they were viviparous during spring and summer; and that they were oviparous only in the tenth generation; that from these eggs the aphides of the following year were hatched early in the spring. His observations have been repeated by other naturalists, particularly by Dr Richardson of Rippon, who has given a very minute account of his observations, in a paper published in the Philosophical Transactions, vol. xi. art. 22. These little animals discharge from their anus a sweet fluid, commonly called *honey-dew*, which attracts the bees and ants. The species are very difficultly distinguished; it is still more difficult to describe them; different species are sometimes found on the same plant.

* *longirostris*.

Of an ash-colour; the snout three times the length of the body. 34. A native of Europe; under the barks of trees; feeds on the larvæ of the ants.

* *vitis*.

56. A native of Europe; on the vine. This destructive little insect cuts through the peduncles, or stems which support the clusters of grapes, in their very early stage, causing them to wither and drop off soon after the fruit is formed.

* *pistacia*.

Black; wings whitish; shanks of the legs very long; the thorax warty. 33. A native of Europe and Asia; on the pistachia; the antennæ moniliform; eyes blackish; the abdomen without bristles, covered with white down, mixed with small balls; the wings sometimes erect. It is lodged in a follicle arising from the base of the leaf, swelling out in the middle, and tapering towards each end, of more than an inch in thickness, at first green, after the insects have left it becoming flesh-coloured.

77 species of this genus have been described in the last edition of the System of Nature.

66. CHERMES.

The snout is a sheath placed in the breast, furnished with three bristles, bent inwards. Antennæ cylindrical, longer than the thorax. Wings four, deflected. Thorax turgid on the upper side. Legs formed for leaping.

These insects inhabit various trees and plants, and produce by their punctures, protuberances and excrescences of various shapes and sizes, in which are frequently enclosed the eggs, and insects in their several states; the larva is six-footed and apterous; the pupa is distinguished by two protuberances on the thorax, which are the rudiments of future wings.

* *graminis*. 1. A native of Europe; on grasses, particularly the *aira flexuosa*.

* *castanea*. Brown; the antennæ setaceous and smooth; the wings very much ribbed. 21. A native of Europe; on different plants.

Twenty-six species of this genus have been described in the last edition of the System of Nature.

67. COCCUS, COCHINEAL.

The snout furnished with bristles, situated in the breast. Antennæ filiform. The anus furnished with bristles. Male with two erect wings; female without wings.

These are extremely fertile, and very troublesome in hothouses and greenhouses: the male is very active, with an oblong body, and ovate abdomen; the tail furnished with a style and two long bristles: the female has a body nearly globular, and is inactive and fixed to different parts of plants.

* *hesperidum*.

Oval, oblong. 1. A native of Europe; on evergreen plants, in greenhouses, e. g. the orange, the laurel, &c.

* *adonidum*.

Reddish, dusted over with powder, and hairy. 4. A native of America and Africa, lately in the warmer parts of Europe; on trees. Body oval and whitish; antennæ and legs brown, marked on the back with an elevated line, and with a raised dot on each of its segments, with the edges of the side acute, furnished with fourteen prominent segments and raised dots; its surface

sprinkled with as many dots set longitudinally between the clavated line on the back and the edge; the tail divided: the perfect insect constructs a follicle in which it conceals itself and its yellow eggs.

Body oblong, ovate; purple or chestnut. 17. On *polonicus*. the roots of the *scleranthus perennis*.—This insect without impropriety may be called the cochineal of the northern part of the world. It prefers cold climates, and is commonly called *coccus tinctorius polonicus*, or the *scarlet grain* of Poland. Ray calls the plant on which it feeds the *polygonum cocciferum*; but it is not confined to one kind of vegetable, for it is found on the mouse-ear, pimpernel, and pellitory, as well as on the *scleranthus perennis*. It is a native of some other northern countries as well as Poland; though formerly the greatest quantity of it used to be collected there. Towards the end of June the *coccus* is in a fit state for gathering. Every one of these creatures is then nearly of a spherical form, and of a fine violet colour. Some of them, however, are not larger than poppy seeds, and others of the size of a pepper corn. The males are produced from the small grains, the females from the larger ones; each of them is lodged, in a sort of cup like that of an acorn. These cups cover more than one half of the body of the animal. They are rough and of a blackish brown on the outside, and smooth and shining on the inside. At the roots of some of the plants only one or two grains are to be found, at the root of others more than forty are to be met with.

Those who collect the grains have a short spade, with which they raise the plants from the ground; after the insects have been collected they replace the plants: the grains are then separated from the earth, which may have adhered to them, by means of a sieve, and sprinkled with very cold water or vinegar to prevent them from hatching.

After this they are dried in the sun, or by gentle artificial warmth; but this must be managed with caution as too hasty drying might injure their colour. Sometimes the grains are separated from their covers, and made up into balls.

According to Bernard de Bemith, the Turks and Armenians make use of these grains not only for dyeing silk and wool, but likewise the manes and tails of their horses. The Turkish women use it for tinging the tips of their fingers. The Dutch formerly mixed it with the true cochineal. The colouring matter extracted from this insect, by means of a solution of alum with the addition of a little chalk, is said to form a lake equal in beauty to that of Florence. The great superiority of the Mexican cochineal, has caused the scarlet grains of Poland to be neglected in all the countries of Europe where dyeing is best understood, as they contain not a fifth part of the colouring matter which may be extracted from the real cochineal.

Body depressed, downy, and transversely wrinkled; *cacti*. abdomen purplish; legs short and black; antennæ subulated, the third part of the length of the body. 22. A native of South America, on the *cactus coccinillifera*. The male is very small; its body is long, of a deep red colour; two long diverging threads proceed from the extremity of the abdomen; its wings are large, white, and incumbent; its legs are pretty long; the antennæ are nearly the length of the body.

The female is more than double the size of the male, when

when at its full growth, it is almost as large as a pea, of a dark brown colour, and covered with a white powder; the antennæ are short; the body flat beneath, and convex above, and edged with annular segments distinctly marked; the legs are short.

The female of this insect is the real cochineal, so highly valued in every part of the world, for the incomparable beauty of the red colour which it affords, which forms so considerable a branch of commerce between the new and old continents. In the year 1736, there was imported into Europe 700,000 pounds weight, worth upwards of 700,000l. sterling. It was a long while made use of before its nature was ascertained: for a considerable time it was thought to be the fruit of some vegetable. The same opinion prevailed with respect to another species of *coccus*, which was much used as a dye before the introduction of the Mexican cochineal, and which, under the name of *kermes*, is collected in Spain, Sardinia, Africa, and Asia Minor. America is still the only quarter from which the true cochineal is to be obtained. The principal countries, where the cochineal insects are bred, are Oaxaca, Tlascal, Chulula, Nueva Galicia, and Chiapa, in the kingdom of New Spain; and Hambalo, Loja, and Tucuman in Peru; but it is only in Oaxaca that they are gathered in great quantities, and form a branch of commerce; the cultivation of these little creatures being there the chief employment of the Indians. It is imported into Europe, in the form of small irregular grains, flat on the one side, and convex on the other: the best is of a slate gray colour, mixed with red, and covered with a white powder. There are two kinds of cochineal, first the fine, called by different names, according to the places from whence it comes, viz *Mastique*, *Campefcane*, and *Tetrafcalle*; of these the *mastique* is reckoned the best. The second is called *sylvestre*, from its being commonly collected from a species of *cactus*, which grows without culture: this is much inferior to the other, both in price and in the quantity of the colouring matter which it affords; it is likewise smaller, and generally believed to be a different species of *coccus*. The plant on which they rear the best cochineal is called *nopal* by the Indians, (*cactus coccinellifera* of Linnæus). The colour of the cochineal is by some supposed to be derived from the juice of this plant. Its flowers and the juice of its fruit are of a beautiful red colour. The natives of those countries where the cochineal is reared, form plantations of the *nopal* in small gardens near their houses; the plant is propagated by cuttings, which grow freely. In about eighteen months after the plantations have been formed they are fit for the reception of the insects. These plantations must be renewed every six years, as the insects succeed best on young vigorous plants.

The *nopal* will grow on almost any soil, and needs no other culture but to be kept clear of weeds, and protected from the north-wind. The insects are placed upon the *nopal* about the middle of October, the period at which good weather commonly commences in Mexico after the rains. Those who rear the insects, take care to preserve a sufficient number of females for this purpose, either by protecting them during the rainy season with a covering of mats, or by removing some branches of the *nopal* loaded with them into their own houses. Eight or ten of these females are put into a small nest,

formed of a tuft of threads collected from a species of palm, or of any other cottony matter, which is attached to the spines of the *nopal*, on that side of the plant exposed to the rising sun, the rays of which promote the hatching of the young insects, which soon proceed in great numbers from the nest, as each female produces upwards of a thousand. The larvæ spread over the plant, and soon fix themselves by means of their trunk; after this, should they by any accident be displaced, they inevitably perish, as their trunks are broken. In some districts the females are preserved during the rainy season in boxes carefully shut up. The males live for little more than one month. The females about double that time. Both of them remain in the state of larvæ for about ten days; they remain fifteen days longer in the state of pupæ. The males when they pass from the state of pupæ get wings; but till that time they are not distinguishable from the females, except that they are only about half the size. After they acquire wings, they impregnate the female, and die. The female, in going through her different changes, does not change her form, but only casts her skin. After she has been impregnated she lives for about a month, and increases considerably in bulk; then lays her eggs, and dies. According to M. Thierry, there are six generations of these little animals in the year. They might be collected during the whole year, did not the rainy season check their progress, and almost entirely destroy them. According to all the writers on the subject, there are three collections made of them yearly. The first takes place about the middle of December, and the last in the month of May. When they make the first collection, they take away the nests, and pick out the dead females, which had been placed on the *nopal* the preceding October. The second collection is made when the insects again begin to produce young. The insects are detached from the plant with a knife, the edge and point of which have been blunted, to prevent the *nopal* from being injured. The insects are received into a vessel as they are separated from the plant, put to death, and dried. The Indians have several ways of killing these insects; which they are anxious to accomplish as soon as possible, because the females may live for some time after they are detached, and produce their young, which might escape and diminish the quantity of cochineal collected. Some natives put the cochineal in a basket, and dip them in boiling water; afterwards they expose them to the sun to dry.

Others put them in a hot oven, or on heated plates of iron. But it appears that the best cochineal is obtained by following the first mode. The different colours imported into Europe depend entirely on the mode of killing the insects. That which has been killed by dipping in boiling water, loses part of the white powder, with which they were covered, and acquires a brownish red colour: this kind is called *renagrida*. That which is killed in an oven retains the white powder, and remains of a gray colour: this is called *jarpeada*. That which is killed by plates of heated iron becomes blackish, and is called *negra*.

The dead females which are taken from the nests which had been put on the *nopal*, lose more of their weight in drying than the insects which are taken off alive and full of young; the first losing three-fourths, and the last two-thirds in drying. After it has been dried

it may be kept for any length of time without losing either weight or colour.

It requires much care and attention to preserve these insects from their numerous enemies. The principal enemies which infest the cochineal are, the larvæ of a species of *coccinella*, which suck them, and leave nothing but the skin. A caterpillar of about an inch long, and of the thickness of a crow quill, is their most destructive enemy, which would soon destroy the whole race, were they allowed to carry on their depredations without molestation. The larvæ of a species of *pinus* feeds on them likewise. There is a species of insect which lives on the nopal in great numbers, and does as much injury to the plant as the cochineal insects themselves do; which pinches their body, prevents them from taking nourishment, and causes them to drop from the plant. A small mouse which always prefers the fine cochineal to the sylvester, because the cottony matter with which the sylvester is more abundantly covered entangles its teeth, also preys on them. Many birds, too, are fond of them, and would destroy great numbers of them, were they not driven away by the owners of the plantations.

The sylvester is smaller than the true cochineal; their bodies are covered with a white cottony matter, and edged all round with hairs. About eight days after they are fixed, the cottony matter and the hairs increase in length, and become so closely attached to the plant, that part of them is commonly left adhering after the insect has been removed. Though these insects commonly feed on a prickly species of *cactus*, which grows wild, the Indians frequently rear them on the nopal, because they are collected from it with much more facility than from the uncultivated species: for the most dexterous workman cannot collect more of the insects in one day than will produce two ounces of cochineal when dry; whereas he can collect from the *cactus coccinellifera* as many as will yield three pounds when dry. There is also another advantage obtained from rearing the sylvester on the nopal which they cultivate in their gardens; the insects become almost as large as the true cochineal, and lose more and more of their cottony covering in proportion to the frequency of their reproduction. The sylvester has been lately introduced into the British settlements in India. The following account of its introduction and comparative value has been published by Mr Nicolas Fontana, who resided for many years in that part of the world.

“The introduction of cochineal into Bengal, which our neighbours had endeavoured to naturalize in their West India possessions, deserves particularly to be marked, as being likely, under proper management, to become not only a new æra in the progressive resources of the company, but an accession of opulence to the British empire: an æra the more remarkable, as, notwithstanding the attempts of government, the design was not accomplished but through accident, the great parent of discovery, which, with never-ceasing influence operates in many ways for the good of mankind.

“After a large plantation of the various species of *opuntia* had been reared at Madras, waiting only the arrival of the insect to make it serviceable, which a long correspondence of thirteen years could not obtain, Dr Anderson’s solicitations about it had almost been forgot-

ten; yet though his laborious industry and zeal for his country’s interest, had no other reward, the introduction of the cochineal insect into India is entirely owing to his publications on the subject, which fortunately fell into the hands of Captain Nelson, who was then stationed at Madras with the 52d regiment. On the captain’s return to India in 1795, the fleet in which he sailed, repaired for refreshment to the port of Rio de Janeiro. In his perambulations a little way out of this town, he was attended as usually by the sentinel, when he saw a plantation of *opuntia* with the insect upon it. This circumstance immediately brought to his recollection the ardent wish for the importation of the insect expressed in the letters he had read at Madras; and he conceived the hope of being able to gratify Dr Anderson’s desire, by carrying some to India with him.

“A day or two previous to his embarkation, he took another walk to the place where he had seen the *opuntia* or nopal. He made bold to ask the cultivators for some of the plant, being curious, he said, in matters of natural history. Having collected several other plants, he wished to have this also. The good people, being the less suspicious as he was in his regimentals, granted his request. They gave him several plants with insects on them, which he carefully carried aboard. Many of these, during the passage to Bengal, which was remarkably long and tedious for such delicate passengers, died. A few insects only remained alive on the last plant, several of the leaves having withered.

“Captain Nelson, on his arrival in Calcutta, sent the survivors to the botanic garden, where they were distributed on the different species of the *opuntia*. This well nigh frustrated the whole labour. On the China and Manilla species, they were found to die fast. It fortunately occurred to make trial on the indigenous *opuntia* of Bengal, which is also abundant in many parts of India. On this the insects thrived amazingly; inasmuch, that from these few, in the course of four or five months, a quantity had been collected sufficient for distribution among all who wished to try the rearing of them, and several plants upon which the insects were feeding were sent to Madras.

“The novelty and importance of the object promising so speedy and plentiful a harvest of fortune, engaged a multitude of individuals to undertake the business; and this, no doubt, the more readily, as the cultivation of this field of wealth required but very little capital. Many golden dreams were enjoyed by the new planters. All who had a mind were provided with insects; and undertook plantations of *opuntia*.

“The anxiety and impatience natural to all, who, indulging in ardent expectations, undertake new enterprises, induced some of the planters of nopal to put the insect upon it when the plant had just emerged from the ground. Others, through inattention, kept their insects in places too near to where the *opuntia* was growing young, which in that tender and premature state was devoured by these creatures when hard pressed by hunger. The unskilful mode of drying was likewise adopted; and some of those persons whose opinions led the multitude, declared in the most decided and positive manner, that the cochineal would never answer, as it would not be found worth the trouble and expence attending the cultivation of it. All these considerations damped in a great measure the ardour of the enterprise.

Many

Many abandoned the pursuit, and left the insects to provide for themselves, after the plants destined for their use were destroyed, wherever they could find nourishment. They were seen flying about indiscriminately on various other plants, and thus perishing; while others rooted out the plantations, and employed the ground for other purposes.

“ Besides the discouraging circumstances already mentioned, it was urged that the species imported into India was the *grana sylvestris*, and that the first specimens sent home had been of no value. They had grown lumpy and musty for want of being properly dried, or thoroughly divested of the cottony matter with which the insect is covered. But supposing, it was added, that a proper mode of drying and preparing it could be found out, and the cultivation of it brought to the greatest perfection, it would soon overstock the market, as there is a certain quantity only, and that not very great, which is required for Europe. This would soon be supplied, and loss instead of gain would accrue to the planters. This excess, however, it was farther urged, was to be presumed only in the case of the country being able to supply plants sufficient for the food of the insect, which was very doubtful on account of its quick reproduction, as it sends forth a new generation every forty days. These with other objections of less force, may easily be refuted by any impartial observer acquainted with the nature of the climate and soil of India, even without any kind of knowledge of agriculture. In such a vast extent of territory as that of the East India Company, and lying under such a variety of climates, it is not surely impossible, or very difficult, to find a climate and soil fitted for the naturalization and rearing the cochineal insect, and where the plants will grow to proper size for affording it food; in the same manner as in the districts of Mexico, where the people who take most pains, have them growing to such a height as to require ladders to gather the insects. Such a state of the plant would check the too rapid reproduction of the insect, and at the same time improve its quality; for it is a fact, that the sylvester cochineal, when bred upon a full grown nopal, loses part of its tenacity, and grows to double the size of that gathered on gummy plants, and is less covered with the cottony substance.

“ The cultivation of cochineal, would in all probability be greatly favoured by the vicinity of a hilly country; such as the Boglepore, Rajahmahl, and Furneah. It can be ascertained by good authority, that there are already in the Chittagong district, plantations of large opuntias, which have been growing for two years past. Whenever the insect shall be placed on these plants, we shall see cochineal of a very good quality. The nature and habits of the natives seem entirely calculated for the employment of gathering the insect; work that may be done by old men, women or boys.

“ As to the drying the insects, there is no country where the sun has such influence as in Bengal. The method of drying in the sun, after scalding the insect in hot water, is that practised in Mexico and in Brazil: the insects collected in wooden bowls are thereby spread from them on a hot dish of earthen ware, and placed alive on a charcoal fire, where they are slowly roasted, till the downy covering disappears, and the aqueous juices of the animal are wholly evaporated. During this operation, the insects are constantly stirred about

with a tin ladle, and sometimes water is sprinkled upon them, to prevent absolute torrefaction, which would destroy the colour: but a little practice will teach them to remove them from the fire, though surely its barbarity ought to prevent its adoption.

“ By an estimate, made on a large scale, of the necessary expence that would attend the cultivation of one hundred biggahs of opuntia, it appeared, that after making every possible allowance for ground rent, ryots gathering, and an European overseer, and interest on disbursement at twelve per cent. the quantity produced of *grana sylvestris*, during nine months of the year, reckoning it at four sicca rupees per seer of thirty two ounces, would more than treble the capital employed. But if this calculation be just in the vicinity of Calcutta, and there is no reason to suppose it otherwise, where labour and ground rent is dear; how much would the whole expence of cultivation and preparation be, if transferred to a greater distance, and to the other provinces!

“ When the insect has been well dried, it should be packed immediately, as it might otherwise be affected by the damp air of Bengal. In this business the method used in Mexico should be followed; which is to put it first into a linen bag, covered with a compact net; and then over the whole an ox's hide sewed so closely as to render it impervious to water.

“ For some of the cochineal which I wanted for the purpose of making experiments, collected at Entally, two miles from Calcutta, I paid in 1796 sixteen rupees per seer; for the same quantity raised by another planter the following year eight rupees; and in 1797, I might have bought a great quantity, part of which came one hundred miles from Calcutta, at five rupees per seer.

“ The improveability of the *grana sylvestris*, by attention, will be ascertained more clearly by the following fact, than by a thousand arguments. Some merchants, at my recommendation, bought about two hundred pounds of cochineal made at Raffapuglah, five miles from Calcutta, at five rupees per seer. The same house paid for seven mauns, or 280 seers, to Mr Stephens at Keerpay, seven rupees per seer; and I can say, that it was the best of the sort that had yet been seen in the town, both for its size, cleaning and drying.

“ Let us now suppose for a moment, such cochineal as that made at Keerpay, to be the best that can ever be obtained at Bengal, and that the above may be within a rupee, more or less, the average price. The *grana fina* that is brought to Bengal by way of Manilla, sells, when abundant, at sixteen rupees per seer, but oftener at nineteen and twenty. The Bengal *sylvestris* contains only from $\frac{2}{8}$ to $\frac{1}{8}$ parts of the colouring matter contained in the other; but say only one half, so that the manufacturer will be obliged to use two seers instead of one, the quality of the colour to be the same; even at this rate, the silk manufactories at Bengal might be supplied with it, with a yearly saving. After supplying this market, if the quantity be increased, there will be a demand for it in the China and English markets, though only of the sylvester kind. Supposing it for ever to remain such, by leaving it to the indolent natives only, even this would be a great acquisition, considering the various ways in which it can be employed by the dyers. Besides, if the prices were immediately to fall, so as not to indemnify the present freight and insurance to the private adventurers, how easy would it be to reduce the in-

fect to a much smaller bulk, by making a lake, and producing carmine no less valuable than the *grana fina*.

"The overstocking of the market, however, with a drug so important, and of such extensive use, is not a thing very likely to happen. The manufacturer, wherever he could get it at a low price, would use it generally, and substitute it in the room of other materials for reds, such as madder, red-wood, and others, used for woollens, and silks; besides the great varieties of shades from scarlet and crimson, down to all those various tints to be obtained by modifications of reagents from cochineal, with a brilliancy, and stability, that would soon repay the small additional expence that might be incurred by the substitution.

"It is a thing greatly to be wished, by every citizen and patriot, that the Bengal cochineal may soon be brought to such a degree of perfection, and produced in such plenty, as may admit of a reduction of its price sufficient to induce the calicoe printers in Europe to use it more commonly than hitherto, in the dyeing of cotton; which would open a much wider field for its consumption. As to the shyness of cotton to the admission of this animal colour, it is not an obstacle that ought by any means to be considered as insurmountable in the present state of chemistry, advancing so rapidly to farther improvements, and particularly applying with vast success many of its operations to the art of dyeing. The few unsuccessful attempts made by manufacturers and chemists to fix this colour on cotton, have been defeated more by the dearth of the drug, than by any impracticability of the design. This exhausted at once the purse and patience, both of the artist and chemist; and precluded that continuation, repetition, and diversification of experiment, which is necessary to the completion of new inventions.

"It was upon cotton that the Spaniards first saw the cochineal used in Mexico; but for want of preparation it produced but a dull crimson. When some of the dried Bengal insect was shewed to the vakeel of the rajah of Napaul, residing as minister to our government at Calcutta, he soon knew it, and declared that it was always used in dyeing his country robes and turbans. The opportunity arising from the management of a chintz manufactory, induced me to make some trials of cochineal in cotton cloth and thread. By these it was ascertained, that the quantity of colouring matter contained in the Bengal cochineal of 1796, compared with the *grana fina*, was from nine or eleven to sixteen. I then repeated, as far as the chemical reagents to be obtained in India would permit, various experiments of the kind mentioned by Dr Bancroft, in his first volume of the Philosophy of Fast Colours; and nearly with the same success, in variety of shades, and degrees of permanency. From these experiments, there resulted two considerable benefits to that manufactory: the first was, that I was induced to make an addition of a certain quantity of powdered cochineal to the morinda root, for the fine cloths and muslins that were to undergo the boiling process in the vat. The second, I was led to mix with the basis for printing red (alum), a decoction of cochineal, instead of the *turmeric* or red wood, formerly used by printers in tracing their designs. This last substitution was only boiled in simple morinda, and the other with the addition of cochineal. By this process,

deep and brilliant reds were obtained, such as had not hitherto been seen in Bengal."

The cultivation, therefore, of the cochineal insect, is an object worthy of all the countenance and care of government. The attempts toward its naturalization ought not by any means to be abandoned; but continued with all persevering industry, and unwearied attention to every circumstance that may promote so important a branch of commerce. For this article we send annually immense sums to the Spaniards. Not only might this expence be saved to Britain; but, in due time, the rest of the world might be supplied from the Bengal produce of this valuable commodity. It is in the recollection of most people conversant with India affairs, how the first specimens of indigo sent home from Bengal were depreciated and rejected. Hence the cultivation of it was obstructed for some years. But when it began to be attended to in 1780, and 1782, by people who were acquainted with the best modes of manufacturing it, it was improved with such rapidity that in 1790, some of the Bengal indigo was judged to be equal to the Guatimala, and bore the same price. The quantity sent home in the years 1795 and 1796, was far beyond what had ever been imported into the port of London from all the world, and more than is required for the annual consumption of Europe. The use of indigo in the dye-house is very circumscribed, and confined chiefly to the colours of blue and green. It gives also a few finer blacks, with lilac grounds; but it cannot, like cochineal, be applied to the various principal colours, as crimson, scarlet, purple, and all the intermediate shades.

Body red; antennæ branched; tail furnished with *ficus*. two bristles. 23. A native of India; on the *ficus religiosa* and *indica*. This is the insect which produces the gum lac.

In the months of November and December, they first appear, and traverse the branches of the trees on which they are produced for some time, and then fix themselves on the extremities of the young branches. By the middle of January, they are all fixed in their proper situations, when they appear as plump as before, but shew no other signs of life. The legs, antennæ, and setæ, are no longer to be seen. Around their edges they are environed with a sub-pellucid liquid which seems to glue them to the branch; it is the gradual accumulation of this liquid which forms a complete cell for each insect, and is what is called *gum lacca*. About the middle of March the cells are completely formed, and the insect is in appearance an oval smooth red bag without life, about the size of a small cochineal insect, emarginated at the obtuse end, full of a beautiful red liquid. In October and November, we find about twenty or thirty oval eggs, or rather larvæ, within the red fluid of the mother. When this fluid is all expended, the young insects pierce a hole through the back of their mother, and walk off one by one, leaving their exuvæ behind, which is that white membranous substance found in the empty cells of the stick lac.

These insects feed on some other trees besides the *ficus religiosa* and *indica* of Linnæus, viz. on the *rhamnus jujuba* (Linn.) and on the *plaso*, (Hort. Malabar.) The insects generally fix themselves so close together, and in such numbers, that scarcely one in six can complete her cell; the others die, and are eaten by various insects.

The

The extreme branches appear as if they were covered with a red dust, and their sap is so much exhausted that they wither and produce no fruit; the leaves drop off or turn to a dirty black colour. These insects are transported from one tree to another by birds. It is worth observing, that these fig-trees exude, when wounded, a milky juice, which instantly coagulates into a viscid ropy substance, and when dried resembles the gum lac.

A red gum is procured by incision from the *plaso*, so similar to the gum lacca, that it may readily be taken for the same substance. Hence, it is probable, these animals have but little trouble in preparing the sap of the trees for the construction of their cells.

The gum *lacca* is rarely seen on the *rhamnus jujuba*, and is inferior to what is found upon the other trees. This gum, in Bengal, is principally found on the uncultivated mountains on both sides the Ganges, where it is produced in such abundance, that the markets might be readily supplied, were the consumpt ten times greater than it is.

The only trouble in collecting it is in breaking down the branches. The best lac is of a deep red colour; if it be pale and pierced at top, the value diminishes, because the insects having escaped, it cannot be useful as a dye, though it may answer better as a varnish.

These insects and their cells have been variously denominated: viz. *gum lacca*, *lack*, *lastra*, and in Bengal *lascha*. By the English, lac is divided into four kinds; viz. *stick lac*, *lump lac*, *seed lac*, and *shell lac*; for which, and their varieties, see the article LAC.

The following account of the lac insect by Dr William Roxburgh, is published in the Asiatic Researches, vol. ii.

"Some pieces of very fresh looking lac, adhering to small branches of the *mimosa cinerea*, were brought me from the mountains on the 20th of last month. I kept them carefully, and to day, the 4th December, fourteen days from the time they came from the hills, myriads of exceedingly minute animals were observed creeping about the lac and branches it adhered to, and more still issuing from small holes over the surface of the cells: other small and perforated excrescences were observed with a glass, amongst the perforations; from which the minute insects issued, regularly two to each hole, and crowned with some very fine white hairs. When the hairs were rubbed off, two white spots appeared. The animals, when single, ran about pretty briskly; but in general they were so numerous, as to be crowded over one another. The body is oblong, tapering most towards the tail, below plain, above convex, with a double or flat margin; laterally on the back part of the thorax are two small tubercles, which may be the eyes; the body behind the thorax is crossed with 12 rings; legs six; feelers (antennæ) half the length of the body, jointed, hairy, each ending in two hairs as long as the antennæ; rump, a white point between two terminal hairs, which are as long as the body of the animal; the mouth I could not see.

"On opening the cells, the substance that they were formed of cannot be better described, with respect to appearance, than by saying it is like the transparent amber that beads are made of: the external covering of the cells may be about half a line thick, is remarkably strong, and able to resist injuries; the partitions are

much thinner; the cells are in general irregular squares, pentagons, and hexagons, about an eighth of an inch in diameter, and a fourth deep; they have no communication with each other: all these I opened during the time the animals were issuing, contained in one half a small bag filled with a thick red jelly-like liquor, replete with what I take to be eggs: these bags, or utriculi, adhere to the bottom of the cells, and have each two necks, which pass through perforations in the external coat of the cells, forming the fore-mentioned excrescences, and ending in some very fine hairs. The other half of the cells have a distinct opening, and contain a white substance, like some few filaments of cotton rolled together, and numbers of the insects themselves ready to make their exit. Several of the same insects I observed to have drawn up their legs, and to lie flat; they did not move on being touched, nor did they show any signs of life, with the greatest irritation.

"December 5th. The same minute hexapedes continue issuing from their cells in numbers; they are more lively, of a deepened red colour, and fewer of the motionless sort. To day I saw the mouth; it is a flattened point, about the middle of the breast, which the little animal projects on being compressed.

"December 6th. The male insects I have found to day. A few of them are constantly running amongst the females most actively; as yet they are scarce more, I imagine, than one to 5000 females, but twice their size. The head is obtuse; eyes black, very large; antennæ clavated, feathered, about two thirds the length of the body; below the middle an articulation, such as those in the legs; colour between the eyes, a beautiful shining green; neck very short; body oval, brown; abdomen oblong, the length of the body and head; legs six; wings membranaceous, four longer than the body, fixed to the sides of the thorax, narrow at their insertions, growing broader for two-thirds of their length, then rounded; the anterior pair is twice the size of the posterior; a strong fibre runs along their anterior margins; they lie flat, like wings of a common fly, when it walks or rests; no hairs from the rump; it springs most actively to a considerable distance on being touched; mouth in the under part of the head; maxillæ transverse.

"To day the female insects continue issuing in great numbers, and move about as on the fourth.

"December 7th. The small red insects still more numerous, and move about as before; winged insects, still very few, continue active. There have been fresh leaves and bits of the branches of both *mimosa cinerea* and *corinda* put into the wide-mouthed bottle with them: they walk over them indifferently, without showing any preference, nor inclination to work nor copulate.

"I opened a cell whence I thought the winged flies had come, and found several, eight or ten, more in it, struggling to shake off their encumbrances; they were in one of these utriculi mentioned on the 4th, which ends in two mouths, shut up with fine white hairs, but one of them was open for the exit of the flies; the other would no doubt have opened in due time; this utriculus I found now perfectly dry, and divided into cells by exceeding thin partitions. I imagine, before any of the flies made their escape, it might have contained about twenty. In those minute cells with the living flies,

flies, or whence they had made their escape, were small, dry, dark-coloured, compressed grains, which may be the dried excrements of the flies.

ilicis.

Shining brown, covered with white down. 6. This insect is commonly called *kermes grains*, and inhabits the *quercus coccifera* of the southern parts of Europe. Mr Hellot of the French Academy of Sciences, in his Art of Dyeing, chapter 12. says it is found in the woods of Vauvert, Vendeman, and Narbonne; but more abundantly in Spain, towards Alicant and Valencia; but also in Murcia, Jaen, Cordova, Seville, Estremadura, la Mancha, Serranias de Cuenca, and other places. In Xiconá, and Tierra de Relluc, there is a district called *de la Grana*, where the people of Valencia first began to gather it, whose example was followed all over Spain. It has some years produced 5000l. to the inhabitants of Xiconá. Both the ancients and moderns seem to have had very confused notions concerning the origin and nature of the kermes; some considering it as a fruit: this opinion was entertained by Pliny, and by most of the ancient naturalists; others taking it for an excrescence formed by the punctures of a particular fly, like the common gall observed upon the oak. Tournefort was of this number. Count Marfigli, and Dr Nisoli a physician of Montpellier, made observations and experiments, with a view of discovering its nature, but did not perfectly succeed. Two other physicians at Aix in Provence, Dr Emeric and Dr Garidel, applied themselves about the same time with greater success; they discovered the kermes to be nothing else than the body of an insect. About the beginning of March they are perceived on the branches of the *quercus coccifera*, very small; they soon fix themselves and become immovable, after which they increase rapidly in size. In April they arrive at their full growth, and are nearly about the size of a pea. About the end of May, sooner or later, according to the warmth of the climate, the husk appears replete with small eggs, less than poppy seed. These are properly ranged under the belly of the insects, progressively placed in the nest of down that covers their bodies. After this it soon dies, though it still adheres to its position, rendering a further service to its progeny, and shielding them from the inclemency of the weather, or the hostile attacks of an enemy. In a good season they multiply exceedingly, producing from 1800 to 2000 eggs. In Languedoc and Provence the poor are employed to gather the kermes; the women letting their nails grow for that purpose, in order to pick them off with greater facility.

The custom of lopping off the boughs is very injudicious, as by this means they destroy the next year's harvest. Some women will gather two or three pounds a day; the great point being to know the places where they are most likely to be found in any quantity, and to gather them early with the morning dew, as the leaves are more pliable and tender at that time, than after they have been parched by the rays of the sun: strong dews will occasionally make them fall from the trees sooner than usual; when the proper season passes, they fall off themselves, and become food for birds, particularly doves. Sometimes there is a second collection; but the insects are commonly smaller, and do not afford so much colouring matter. The insects which are produced in the spring, are generally found adhering to the bark;

those of the second crop are commonly attached to the leaves.

Those who buy up the kermes for exportation, spread it on linen, taking care to sprinkle it with vinegar, to kill the insects, which causes a red dust to separate from them; in Spain, this is carefully collected, and kept apart by itself. After it has been dried, they pass it through a sarse and put it up into bags. In the middle of each, its proportion of red dust is put into a leather bag, which likewise belongs to the buyer. The people of Hinojos, Bonares, Villalba, and of some other parts in Spain, dry it on mats in the sun, stirring it about, and separating the red dust, which is the finest part; which they sprinkle with vinegar, and call *pañil*. The kermes is much in request on the coast of Barbary, particularly that which comes from Spain. The people of Tunis mix it with what is brought from Tetuan, for dyeing those scarlet caps so much used in the Levant.

43 species of this genus, have been described in the last edition of the System of Nature.

68. THRIPS.

Snout concealed within the mouth. Antennæ filiform, of the same length with the thorax. Body linear. Abdomen capable of being bent upwards. Wings four, straight, incumbent, narrower than the body, and nearly forming a cross.

The insects of this genus leap about very actively on flowers; their feet are vesicular; the larvæ are equally active with the perfect insect; commonly red.

The elytra yellowish; body black. 2. A native of **physapus* Europe; on compound flowers. It shuts up the flowers of the *lotus corniculatus*, and causes them to swell out; it is very destructive to wheat and rye, frequently rendering the ears quite empty.

Eleven species of this genus have been described in the last edition of the System of Nature.

III. LEPIDOPTERA.

WINGS four, covered with small scales laid over one another, like tiles on the roof of a house. The mouth furnished with a spiral tongue. Body hairy.

69. PAPILIO, the Butterfly.

Antennæ thicker towards the points. Most frequently they are both clavated and furnished with a knob at the extremity. Their wings, when at rest, are for the most part erect. They fly about in the day time.

The butterfly feeds on the nectarious juice of flowers, or on the saccharine juice which exudes from the leaves of vegetables. Their larvæ are active, and run about a good deal. They are furnished with tentacula and 16 feet; some are naked, others covered with prickles, and feed on the leaves of plants. The pupa is naked, and remains torpid for a longer or shorter period; frequently adhering to different substances, by means of threads attached to its middle or head. The perfect insect is furnished with two feelers, but wants jaws, and has

has four or six feet. Their names are frequently taken from the plants on which they feed.

These butterflies which belong to the family of *knights* are, for the most part, furnished with filiform antennæ, and with a tail or long appendix to the wings; the larvæ are commonly variegated, and but few of them are natives of Europe.

Linnæus has arranged the genus of BUTTERFLY into six divisions, and these again into many subdivisions.

1. **EQUITES.** Alis primoribus ab angulo posteriori ad apicem longioribus quam ad basin; his sæpe antennæ filiformes.

1. **KNIGHTS.** Those which have their upper wings longer from the posterior angle to the tip, than to the base, and have their antennæ for the most part filiform.

A. *Troes.* Sæpius nigri, maculis ad pectus sanguineis.

A. *Trojans.* Those equites that are generally black, and marked on the breast with spots of a blood-red colour.

B. *Achivi.* Pectora non cruenta, oculo ad angulam ani.

B. *Greeks.* Such as are not marked on the breast with red spots; but have an ocellus at the angle of the wing near the anus.

a. Alis absque fasciis.

a. Wings without bands.

b. Alis fasciatis.

b. Wings marked with bands.

2. **HELICONII.** Alis angustis integerrimis, sæpe denudatis; primoribus oblongis, posterioribus brevissimis.

2. **HELICONII.** Those which have narrow and perfectly entire wings, frequently bare, the upper ones oblong, the under very short.

3. **PARNASSII.** Alis integerrimis rotundatis.

3. **PARNASSII.** Those with wings perfectly entire, the upper pair being round.

4. **DANAI.** Alis integerrimis.

4. **DANAI.** Wings perfectly entire.

A. *Candidi.* Alis albis.

A. *Candidi.* Wings white.

B. *Festivi.* Alis variegatis.

B. *Festivi.* Wings variegated.

5. **NYMPHALES.** Alis denticulatis.

5. **NYMPHALES.** Those with wings notched.

A. *Gemmati.* Alis ocellatis.

A. *Gemmati.* Wings adorned with several ocelli.

a. In alis omnibus.

a. on all the wings.

b. primoribus.

b. on the upper wings.

c. posterioribus.

c. on the under wings.

B. *Phalerati.* Alis absque ocellis.

B. *Phalerati.* Wings without ocelli.

6. **PLEBEII.** Parvi, larva sæpius contracta.

6. **PLEBEII.** Such as are small and have contracted larvæ.

A. *Rurales.* Alis maculis obscurioribus.

A. *Rurales.* Such as have their wings marked with obscure spots.

B. *Urbicole.* Alis maculis sæpius pellucidis.

B. *Urbicole.* Those with transparent spots on their wings.

1. EQUITES.

A. Troes.

† Wings furnished with a tail.

Wings of the same colour, both on their upper and *hector.* under surfaces, black; the upper ones marked with a white band, the under with red spots. A native of India; on the *aristolochia*. The white band on the upper wings is composed of eight white half-divided spots. The scarlet spots on the under wings are round and form a double arch.

Wings black, both above and below marked with a *ascanius.* white band, common to both wings; that on the lower clouded with red. A native of the Brasils. It resembles the *tinctoria*; body black, breast marked with blood-coloured spots.

Wings of the same colour, both on their upper and *antenor.* under surfaces, black spotted with white; the under ones marked with circular red spots along their edges. A native of India. Head red; antennæ and thorax black; abdomen white, with red bands; wings marked with numerous white spots, the lower part greenish in the middle with a red circular spot at the angle of the tail.

Wings nearly of the same colour on both upper and *glaucus.* under surfaces, clouded; the upper wings marked with a yellow spot, the under with a tawny one near the tail. A native of America. The under surface of the lower wings are marked with red and yellow spots.

Wings black, sprinkled with green and gold dots, *palinurus.* and marked with a bluish green band. A native of Tranquebar. Body covered with green and gold specks. Wings black, speckled with white on their under surface. The upper ones ash-coloured at the tip, the under marked with tawny spots along their edges.

Wings black, the under ones of a shining green, the *philenor.* under surface marked with seven red spots somewhat resembling eyes. A native of America. Body black; abdomen speckled with white; margin of the upper wings variegated with white and black; under ones with a few faint white specks; the margin variegated with white and black, marked with a white dot at the base on the under surface; the tip greenish, with seven round tawny dots surrounded with a black ring, and marked with a small white lateral dot.

Wings black, with a white band; the under surface *afus.* of the lower wings marked at the base and at the tip with red. A native of America. Thorax marked with an ash-coloured lateral line; breast with an ash-coloured dot on each side; abdomen with an ash-coloured lateral line beneath; upper wings with both surfaces alike; under ones black above, with three scarlet circular spots at the angle of the tail, and five white ones at the margin, brown beneath, marked with red spots at the base, a red line at the inner margin, and three circular spots at the angle of the tail, with four white circular spots on the outer margin.

†† Wings notched.

Wings notched and silky, the upper ones green on *priamus.* their superior surface, marked with a black spot, the under with six black spots. A native of Amboyana. This

This is the most remarkable species of this genus, both for its size and beauty. Head and legs black; abdomen bright yellow, and the sides of the thorax variegated with scarlet lines.

ancibilis.

Wings of the same colour on both their upper and under surfaces, black; the under wings marked with seven oval scarlet spots. A native of America; on the orange-tree. The larva is prickly, brown marked with white circular stripes, and furnished with tentacula. They are gregarious. Pupa brown, marked with four projections on its anterior part.

B. *Achivi.*

† Wings furnished with a double tail.

pyrrhus.

Wings brown, each of them marked with a white band, the band on the upper wings as it were halved. A native of South America and India.

etcocles.

Wings of a dusky blue, marked on both sides with a white band, the edges of the under ones green. A native of Africa.

†† Wings furnished with two notched tails.

tiridates.

Wings black on their upper surface, spotted with blue, and marked with a dotted white edge. A native of Amboyna.

pollux.

Wings brown; marked with a yellow band on their upper surface, and on their under surface with a white band and white spots. A native of Africa.

††† Wings furnished with two very slight tails.

cocles.

Wings striped, with white and yellow, with a white band in the middle; the lower wings marked on their under surfaces with a strip of dots resembling little eyes. A native of Siam. Of a middle size, and very tender.

†††† Wings notched and furnished with a tail.

polycæon.

Wings black, marked with a yellow band; the under surface of the lower wings marked with tawny blue and yellow circular spots. A native of Surinam; feeds on some species of the *althæa*.

xiphares.

Wings black, the upper spotted with white, the under ones marked with a yellow band. A native of Africa.

††††† Wings furnished with a tail.

ulysses.

Wings black, with a blue radiant centre; the under surface of the lower ones adorned with seven ocelli. A native of Asia.

agamemnon.

Wings black, spotted with green; the under surface of the lower ones adorned with an ocellus, and with red spots. A native of Asia.

* *machaon.*

Wings of the same colour in both surfaces, yellow with a brown edge, marked with yellow circular spots, and with a tawny one at the angle of the tail. A native of Europe; on umbelliferous plants, and on rue. The larvæ are seldom found in numbers together, are smooth and marked with annular strips of green and black, dotted with red; their tentacula are short and yellow. They emit a very disagreeable smell by which they keep off the *ichneumon*. Their pupa is black and yellow. The under wings are adorned with an eye of a yellowish-red colour, encircled with blue, which is

situated at the edge nearest the extremity of the abdomen. This is the largest and one of the most beautiful butterflies which Britain produces. It changes into the pupa in July, assumes the winged state in August, and frequents meadows. Sometimes it appears in May.

Wings nearly of the same colour both on their upper * *podalirius* and under surfaces, marked with brown bands set in pairs; *us.* the under surface of the lower wings marked with a blood-coloured line. A native of Europe and the northern parts of Asia and Africa. It feeds on different species of the *brassica*: Larva solitary, yellowish dotted with brown; head pale green; pupa yellowish dotted with brown, marked with two slight projections towards the anterior extremity.

Wings white, the upper ones marked with black *alcibiades*. bands along the edges, the under ones marked on their superior surface with red near the tip. A native of Tranquebar. Head tawny, with a broad black line in the middle; thorax downy and ash-coloured, marked with two tawny spots; abdomen whitish, marked on the sides with a line of black blotches; upper wings greenish at the base; under ones marked with a black spot near the tail, and marginal circular spots; tail long, black tipped with white, streaked with black beneath.

††††† Wings terminating in a slight projection faintly resembling a tail.

Wings brown, marked on their under surfaces with *phidippus*. white bands, adorned with two eyes, and with a double eye at the tail. A native of India. The female much larger than the male.

Wings brown, black at the tip, spotted with white; *aurelius*. the under wings on their lower surfaces adorned with two eyes. A native of India.

Wings; upper surfaces brown, under wings with a *jason*. band marked with six green blotches. A native of South America and India.

Wings brown; the under wings marked with two *philocetes*. blue ocelli, with black pupills, and three white dots. A native of South America and India. The female has a tuft of long diverging hairs at the end of the upper wings.

Wings black, marked with a plain green band; the *nerceus*. under surfaces of the wings are blackish. A native of South America and India.

†††††† Wings notched.

Upper surfaces of the wings of a bright blue, the *menelaus*. under spotted with brown. A native of South America. The larva prickly and yellow, marked with rose-coloured strips; head brown and feet red. Pupa pale, and has a cylindrical infested tail.

Upper surfaces of the wings brown spotted with *nestor*. white and blue in the centre; their under surfaces adorned with three or four eyes. A native of America.

Wings brown; the upper surfaces of both have a *telemachus* large radiated disk, the under surface of each marked with six eyes. A native of South America.

Wings pale blue, and black at the tips, spotted with *perseus*. red. A native of Surinam.

Upper surfaces of the wings black, marked with a *achilles*. blue band; the under ones are brown, adorned with three or five eyes. A native of America.

Under

argyrios. Under surfaces of all the wings of blue and silver; the upper wings black on their superior surfaces, marked with two silver bands, and with two brown ones on the under surface; the under wings marked on their superior surface with a broad silver band, and with seven spots of blue and silver. 378. A native of Asia.

†††††††† Wings faintly notched.

idomeneus. Wings nearly crenated, and of a dusky blue colour; the under surfaces clouded, and adorned with two ocelli. 45. A native of South America. The larva is reddish, with feathery protuberances set round it in a ring. The pupa is dentated and furnished with two crooked horns at the head.

2. HELICONII.

terpsichore. Upper wings yellow; under wings of a deeper yellow than the upper, sprinkled with black spots. 55. A native of Asia.

calliope. Wings yellow; the upper marked with three black streaks, and the under with three black bands. 56. A native of South America and India. Tips of the upper wings speckled with white.

polymnia. Wings pale-yellow; the upper ones marked with a bright yellow band, the under with three black bands. 58. A native of South America. Larva yellowish and prickly.

viola. Wings tawny, dotted with black, and the under ones have a black edge dotted with white. 359. A native of India; on the violet and borragé.

ricini. Wings brown; the upper wings marked on both sides with two white bands. 63. A native of America; on the *ricinus palma christi*; the base of the under wing in the male marked with purple, in the female with blue; the larva green, covered with white hairs.

3. PARNASSII.

apollo. Wings white, spotted with black; the under wings are red at the base, and adorned with four ocelli on their upper, and six on their under surfaces. 50. A native of Europe, and feeds on the *sedum telephium*, and the *saxifraga cotyledon*; flies about slowly; the larva solitary, silky, black, and furnished with two tentacula at the back part of its head; all its segments are marked on each side with two red dots. The pupa covered with a slight follicle; oval, bluish, and marked on each side with red dots on the anterior part.

nemofyne. Wings white, with black veins; the upper ones marked with two black spots near their edges. 51. A native of Europe.

* *erategi*. Wings white, with black veins. 72. A native of Europe; on fruit trees. It is very destructive in gardens and orchards, and emits a fluid of a reddish colour, which has frequently given rise to the reports of showers of blood which are said to have fallen in different places. Larva gregarious; hairy and yellow, green beneath; head black; body marked with three black lines; pupa greenish, with black spots and dots.

andromache. Wings of the same colour, both on their upper and under surfaces; the upper ones dusky and naked, the under yellow. 382. A native of New Holland. Head black; feelers yellow; thorax black, with a yellow dot on each side; breast spotted with yellow; posterior VOL. VIII. Part I.

margin of the lower wings black, marked with seven yellowish dots.

4. DANAI.

A. Candidi.

Wings black at the tips, marked with two black spots. 75. A native of Europe; on some species of *brassica*. The upper wings in the male are without black spots, and the same happens in the two following species. The larva solitary, dotted with black, and marked with three sulphur-coloured lines; the tail black; pupa pale green, marked with three yellow lines, and three of its segments globular; eggs set in clusters.

Smaller than the preceding species; wings white, upper ones tipped with brown; the female has three brown spots on the upper, and one on the lower pair. 76. A native of Europe; on the turnip and other species of *brassica*; also on the *tropaeolum*. Larva green; marked with a bright yellow line on the back, and bright yellow on the sides; pupa greenish, marked with three sulphur-coloured lines.

Wings marked on their under surfaces with broad greenish veins. 77. A native of Europe; on several species of *brassica*.

Wings roundish; of a dusky colour at the tips. 79. A native of Europe; on the mustard.

Wings white above; the upper ones on their superior surface, black at the edge and tip, which is marked with four white dots; inferior surfaces black, marked at the tips with four yellow spots and a yellow base; the inferior surface of the under wings scarlet, marked with black veins. 881.

Wings roundish, brown at the edges; their under surfaces of a grayish yellow spotted with white. 81. A native of Europe; on different kinds of *reseda* and *brassica*; larva covered with bluish hairs, marked with black spots and yellow streaks.

Wings round; the centre of the upper ones tawny; the inferior surface of the under ones clouded with green. 85. A native of Europe; on the *cardamine*, *brassica*, and *thlaspis*. Larva solitary; greenish above and whitish beneath. Pupa green, marked with a white line on each side; thorax conical, ascending.

Wings yellow, with black tips, and a brown margin; the inferior surface of the under ones marked with a silver dot. 99. A native of Europe, on the *coronilla*; wings sometimes whitish. Larva somewhat hairy; green marked with yellow lines and black dots.

Wings angular and yellow; each marked with a rusty-coloured spot. 106. A native of Europe; on the buckthorn. Commonly flies about in August, though frequently it lies dormant all winter, and appears early in the spring. The male is very often of a sulphur colour; the female white. Larva smooth; and green with a dark line on the back. Pupa in the anterior part turgid, and drawn to a point.

B. Festivi.

Wings almost entire, brown with a rusty-coloured band divided at the point. The lower surface of the under wings ash-coloured and adorned, with two ocelli. The larva, green, streaked with red, with two prickles

A a

on

on its head, and tail divided. Pupa reddish, with silvery spots. 120.

* *hyper-*
anibus.

Wings entire, of a dusky colour; the lower surface of the upper ones adorned with three ocelli, and the inferior surface of the under wings with two or three. 127. A native of Europe; is found at the roots of the *poa annua*; the wings sometimes have ocelli on their upper surfaces. Larva solitary, hairy, and of an ash-colour, marked with a black line behind; the tail furnished with two little prominences; pupa brown, spotted with yellow; and has a bunch on its back.

oedipus.

Wings entire; their upper surfaces black, without spots, the under brown; the upper wings adorned with three ocelli, the under with five. 495. A native of Europe.

* *pamphi-*
lus.

Wings perfectly entire and yellow; the upper adorned on their lower surface with one ocellus; the under ones ash-coloured, marked with a band and four faint ocelli. 239. A native of Europe; on the *cynofurus cristatus*; in woody meadows. Larva and pupa green; the former marked with a white line, and has two small prominences at the tail.

arcanius.

Wings perfectly entire, of a rusty colour; the upper marked on their inferior surfaces with a single ocellus; the under wings with five, the first being separated by a band. 242. A native of Europe; in woody meadows. Larva green, marked on the back with dust-coloured lines, and on the sides with yellow lines; the tail furnished with two little prominences.

alexander.

Wings perfectly entire, brownish; (the upper wings of the female tawny), the lower surface of the under ones ash-coloured and tawny at the tips, adorned with six ocelli. 503. A native of Europe; somewhat resembling the last.

5. NYMPHALES.

A. Gemmati.

* *jo.*

Wings angularly notched, tawny, spotted with black; each adorned with one ocellus. 131. A native of Europe. Larva gregarious, prickly, black, dotted with white; their hind legs of a rusty colour. Pupa green, dotted with gold; having ten small projections on the fore part of the body; the tail divided.

* *macra.*

Wings notched, brown; the upper marked on both surfaces with one ocellus and a half; the under adorned on their superior surfaces with three ocelli, and on their inferior with six. 141. A native of Europe; on pasture ground. Larva greenish, somewhat hairy, having two small prominences at the tail. Pupa greenish, slightly divided, and prickly on the sides.

* *megara.*

Wings notched, yellow, and marked with brown bands; the upper adorned with one ocellus, and the under with five ocelli on the superior, and six on the inferior surface. 142. A native of Europe; on pasture ground. Larva hairy, green, striped with white; the tail divided.

* *ageria.*

Wings notched, brown, spotted with yellow; the upper adorned on both surfaces with one ocellus; the under with four ocelli on their superior surface, and four dots on their inferior. 143.

phadra.

Wings notched, brown on both their superior and inferior surfaces; the upper wings adorned with violet-coloured ocelli. 150. A native of Europe; feeds chiefly on the *avena elatior*. Larva gray, with two lines of

black dots on its back; tail divided. It remains under ground till it has undergone its metamorphosis.

B. Phalerati.

Wings notched, of a dusky colour, marked with *populi* white dots and bands; their inferior surfaces yellow, marked with white bands and black spots. 162. A native of Europe; on the *populus tremula*. The female marked with a broader white band than the male. Larva prickly, and variegated; head and tail tawny. Pupa yellowish, dotted with black.

Wings angular, black, with a whitish circumference. 165. A native both of Europe and America; on the birch and willow. When it appears in spring, the edges of the wings are white, and in the summer they become yellow. Larva gregarious, prickly, black, marked with square rusty-coloured spots on the back. Pupa black, marked with small projections and tawny dots.

Wings angular, tawny, spotted with black; the upper ones marked on their superior surface with four black dots. 166. A native of Europe; on fruit trees. Larva gregarious, prickly, blackish, marked with a yellow line on the sides. Pupa of a flesh colour.

Wings angular, tawny, spotted with black; the superior surface of the upper wings marked with three black dots. 167. A native of Europe; very common on the nettle; supposed, though often falsely, to be a forerunner of spring. Larva gregarious, prickly, brown, variegated with green; the head black. Pupa brown, marked with small projections, and golden spots on the neck, and sometimes entirely of a golden colour. This insect, and many others of the same genus, *p. atalanta*, *polychloros*, *jo*, &c. soon after their enlargement from the chrysalis state, discharge a few drops of a reddish coloured fluid; which in places where they have appeared in great numbers, has had the appearance of a shower of blood, and been marked by writers as a prodigy foreboding some extraordinary event.

Wings angular, tawny spotted with black; the under ones marked on their inferior surface with a white C. 168. A native of Europe; on the nettle, willow, and gooseberry. Larva solitary, prickly, and tawny; the back yellow on the fore part, and white behind. Pupa of a flesh colour, contracted in the middle, dotted with gold.

Wings notched, yellow, variegated with black, and radiated at the tips; the under ones marked with seven red dots. 607. A native of Europe; on the *aristolochia clematis*. Larva yellow, marked with black, furnished with prickles set round in a circle; red, with black tips.

Wings black, spotted with white; the upper ones marked with a purple band on both sides, the under with a purple band along the edge. 175. A native of Europe and America; on the nettle. Larva solitary, prickly, green, marked with yellow lines on the sides. Pupa marked with small projections; blackish above, and ash-coloured below, dotted with gold.

Wings angularly notched, brown, marked with tawny spots and a single white one; the under wings gray on their inferior surfaces. 639. A native of the south of Europe. Larva green, marked with white lines, spotted with black. Pupa green, marked with white lines.

Wings slightly notched, variegated, and reticulated, *levana*.
on

on their inferior surface; the upper ones marked on their superior surface with some white spots. 201. A native of Europe; on the common thistle. Larva gregarious, prickly, and black; legs red; head marked with two prickles; pupa furnished with small brown projections; thorax yellowish below.

* *adippe*. Wings notched, brown, spotted with black, adorned on the inferior surface with twenty-three silvery spots. 212. A native of Europe; on the *viola odorata* and *tricolor*: the silver spots sometimes, though rarely, change into yellow; larva ash-coloured or brown, covered with many reddish prickles, and marked on the back with a black line, rising out of a white one; pupa brown, marked with silver dots.

6. *PLEBRII*.A. *Rurales*.

cupido. Under wings terminating in six small projections, white on their inferior surface, marked with silver spots. 217. A native of America; on the cotton. Larva white, dotted with black.

* *betulae*. Wings furnished with a slight tail, the under ones marked with two white streaks. 220. A native of Europe; on the birch and sloe. Wings of the male marked with tawny spots; larva thick, green, marked with two obliquely transverse white lines, and two small furrows on the back; pupa smooth, of a rusty colour.

pruni. Wings slightly tailed, brown above, with a red spot at the tip of the lower ones; lower wings beneath with a tawny marginal band, dotted with black. 221. A native of Europe; on the plum-tree. Larva thick, green, with a pale lateral line; pupa brown, with a white head.

* *quercus*. Wings slightly tailed, bluish, beneath ash-coloured, with a white streak and double tawny dot near the tail. 222. A native of Europe; on the oak. Larva thick above, of a rose colour; with three lines of green dots. Pupa smooth, of a rusty colour; with three lines of brown dots on the back.

cerasi. Wings tailed, brown, without spots; the inferior surfaces marked with a white streak, and tawny circular spots; the under wings marked with a black dot. 719. A native of Europe; on the cherry tree.

sedii. Wings furnished with a tail, blue, with a white spotted edge, white on their inferior surfaces, marked with black square spots, and a reddish band. 743. A native of Europe; on the *sedum telephium*. Larva green; marked with a red line on the back. Pupa obtuse; green on the anterior, and brown on the posterior part.

cyllarus. Wings entire, and blue with a black edge; beneath of a brownish colour, adorned with a streak of dots resembling ocelli; the under wings on their inferior surface blue at the base. 750. A native of Europe; on the flower of the *astragalus* and *mellilot*. Larva pale; marked with a red streak on the back, and on the sides with oblique green lines; head black. Pupa brown, spotted with black.

B. *Urbicolae*.

comma. Wings perfectly entire, spreading so as to form an obtuse angle, tawny, marked with a small white line, and with white dots beneath. 256. A native of Europe; the line wanting in the female. Larva of a shining red; head black, with a white strip on the collar. Pupa long, cylindrical, and brown.

Wings perfectly entire, spreading so as to form an obtuse angle; tawny, with a black margin. 817. A native of Europe; upper wings in the male marked with a small black line on the middle. Larva solitary and green. Pupa green; with a very thin covering.

Wings notched and spreading so as to form an obtuse angle; brown, waved with ash colour; the upper wings marked with transparent dots; the under ones with white dots. 267. A native of Europe; in the *malva* and *althæa*. Larva gray; head black; neck marked with four sulphur-coloured dots. It draws together the leaves on which it feeds, by threads which it spins. Pupa hunch-backed and bluish.

876 species of the butterfly have been described in the last edition of the System of Nature published by Gmelin; but a great many more are to be met with in the collections of the curious, which have not yet been described by any author.

SPHINX, *Hawk-moth*.

Antennæ nearly prismatic, thickest in the middle. Tongue (in most species) projecting. Feelers two, bent back. Wings deflected.

* Legitimæ. *Antennæ scaly, Feelers hairy, Tongue spiral.*

† *Wings angular.*

The under wings reddish, adorned with a blue eye. * *ocellata*. 1. Native of Europe and America; on the *spiræa*, willow, and fruit trees; the thorax marked with a rusty-coloured spot, the tongue very short. The larva solitary, rough, green, and furnished with a tail; marked with obtuse white streaks, and dotted with yellow ocelli. The pupa is brown, with a black back.

Wings angularly notched, yellowish, marked on the under surface with brown bands; the under wings with a red band. 48. Native of Europe, on the oak. The body of the male is ash-coloured; that of the female brown. The larva solitary, furnished with a tail, and green; marked on the sides with oblique white stripes, and with reddish specks. The pupa a light brown, with reddish edges.

Wings dentated, reversed and gray; the under wings of a rusty colour at the base; the upper ones marked with a white dot. 2. Native of Europe; on the poplar and willow. The larva solitary, rough, green, furnished with a tail; it is marked on each side with a white line, and with white oblique cross stripes. The pupa a dusky gray, and of a rusty colour behind.

Wings marked with greenish bands, and clouded with dark green; the superior surface of the upper wings of a yellowish brick-colour. 13. Native of Europe; on the lime-tree. The larva solitary, rough, green, furnished with a tail. It grows smaller towards the head, and is marked on the sides with oblique blood-coloured and yellow stripes. The pupa of a dusky brown.

Wings irregularly notched, and greenish, marked with a dark green band; the under wings tawny, and black at the tips. 54. Native of Europe; on the *anothera*. The larva solitary, brown, and without a tail; marked with blood-coloured specks, and with a black ocellus, the pupil of which is white, on the last

segment but one of the abdomen. The pupa is uncovered, and light brown.

nerii. Wings faintly angular and green; variegated with bands of pale or dark green, and yellow. Native of Europe; on the *nerium*. The larva solitary, dotted with white, and marked on each side of the neck with a blue ocellus. The tail is bent down, and almost jointed. The pupa yellow, marked with a black line and black dots on the back.

†† *Wings entire*.

* *convolvuli*. Wings clouded; the under ones faintly marked with bands; the abdomen marked with belts of red, black, and white. 6. Native of Europe; on the *convolvulus*. It smells of ambergrise. Its eyes are very bright. The larva furnished with a tail; marked on each side with oblique white lines, and dotted with faint *ocelli*. The pupa light brown, furnished with a reflected involuted horn.

* *ligustræ*. The under wings reddish, marked with three black bands; the abdomen red, surrounded with black belts. 8. Native of Europe; on the privet, lilac, ash, and elder. The larva green, and furnished with a tail; marked on the sides with oblique streaks of a carnation colour towards the anterior part of the body, and white towards the posterior. The fore part of the body is erect, and it rests with the feet elevated. The pupa brown; with a tail formed of four small projections.

* *atropis*. The under wings yellow, marked with brown bands; the abdomen yellow, marked with black belts. 9. Native of Europe; on the jessamine, potato, and hemp. It is also a native of Africa and Asia; but the variety to be met with there, is double the size of that in Europe. It makes a noise by rubbing its feelers against its tongue. The larva is solitary, and lies concealed under ground all day, coming out in the evening to feed. It is yellow dotted with black, and furnished with a tail which is bent down; it is marked on the sides with cross lines, half blue, half green. The pupa light brown, marked on both sides with black specks.

* *celerio*. Wings gray, marked with white streaks; the under ones with brown ones, and with six red spots. 12. Native of the south of Europe; on the vine. The larva is brown, marked on the sides with two white lines, and with two ocelli on each side of the neck. It is furnished with a tail. The pupa is of a dark brown before, and of a light brown behind.

* *elpenor*. The wings variegated with purple and green; the under wings red, and black at the base. 17. Native of Europe; on the French willow, the balsam, the convolvulus, and the vine. The larva is furnished with a tail, and is spotted with black; it is also adorned with two blue ocelli on each side of the neck. The pupa on the anterior part of the body is of a dusky gray, and brown on the posterior part, marked with dark-coloured specks.

* *euphorbia*. Wings gray; the upper ones marked with two green bands; the under with two red bands, with a black streak at the base; the antennæ a pure white. 19. Native of Europe; on the *euphorbia*. The larva is furnished with a tail, and is black, marked with white; marked with a blood-coloured line on the back, and on the sides with yellow dots. The pupa light brown, marked with black specks.

** *Sesiae*. The Wings entire; the Tail furnished with a beard; the Tongue projecting, and terminating abruptly; the Antennæ cylindrical.

The sides of the abdomen variegated with black and white; the under wings of a rusty colour. 27. Native of Europe; on the madder, and on the rest of these plants which form the natural order called *stellatæ*. The larva is spotted with white, and is furnished with a blue tapering tail, of a rusty colour at the tip. The pupa brown.

The abdomen black, marked with a yellow band; the wings transparent, with a black edge. 28. Native of Europe; on the woodbine, and on the scabious. The larva is green, marked on the sides with a yellow line, and furnished with a reddish horn. The pupa black, marked on the fore part of the body with yellow streaks, and enclosed in a follicle.

The wings transparent; the abdomen yellow, with yellow incifures; the thorax black, marked with two yellow spots. 29. Native of Europe; on flowers. The larva on the trunk of the poplar-tree.

The upper wings brown, the under wings transparent; the abdomen black, marked with three yellow belts. 102. Native of Europe.

The wings transparent, with a black edge and black band; the abdomen black; the second and last segments marked with a yellow margin. 31. Native of Europe.

The wings transparent, with a black edge and black band; the abdomen black; the incifures are alternately marked with a yellow margin. 32. Native of Europe. Feeds on the pith of the common red currant.

*** *Zygænæ Fabricii*, f. *Adscitæ*. The Tongue projecting, and setaceous; the Antennæ thicker in the middle.

The upper wings blue, marked with six red dots; the under wings red with a blue edge. 34. Native of Europe; on the *Spiræa filipendula*. There is a variety of this species (*S. peucedani*) distinguished by a red belt on the abdomen, which feeds on the *peucedanus*. The larva is thick, of a sulphur-colour; marked with four rows of black dots, and furnished with a tail. The pupa is brown, of a sulphur-colour in the middle, and marked with brown specks.

Black; the upper wings green, marked with three oblong blood-coloured spots, placed near one another; the under ones red. 106. Native of Europe. The larva hairy and white; the head marked with two lines of black dots; the fore legs are black; the hind legs yellow.

Blue; the upper wings green, marked with five red spots; the under ones of a blood-colour, and without spots. 107. Native of Europe; on the *lotus corniculatus*.

Greenish-black; the wings marked with transparent dots, six on the upper, and two on the under wings; the abdomen marked with a yellow belt. 35. Native of Europe; on the oak, &c. The larva brown, with reddish head and legs; with tufts of whitish feathers on the back.

Blue; the upper wings marked with six red dots; the under ones with one red dot; the abdomen girt with a red belt. 36. Native of the south of Europe; on the *medicago*.

medicago. Sometimes the wings are dotted with white, and the base of the upper wings and the abdomen marked with a yellow belt. The larva hairy and yellowish; the head, legs, and two lines on the body, are of a pale yellow colour.

165 species of this genus have been described in the last edition of the System of Nature.

71. PHALÆNA, *Moth*.

Antennæ growing gradually smaller from their base to their tip. Tongue spiral. Jaws none. Shield (in most species) short, and of a horny substance.

Moths fly about at night, have their antennæ composed of many articulations, and commonly pectinated in one or both sexes. They feed chiefly on the nectareous juice of flowers. The larva is active, commonly smooth, and more or less cylindrical, and feeds on the leaves of plants. The pupa remains torpid, is generally cylindrical, sometimes pointed before, sometimes at both ends, and in most instances covered with a follicle.

PHALÆNÆ dividuntur in, MOTHS are divided into,

1. BOMBYCES. Larva 16-poda, sæpius pilosa, subcylindrica; pupa apice acuminata; antennis filiformibus, apice acutis; palpis duobus, compressis, reflexis, æqualibus, pilosis, obtusis; lingua spirali, brevi, membranacea, vix exserta, filiformi, obtusa, bifida.

a. *Attacos*, alis patulis.

b. *Bombyces*, alis non patulis.

α. Alis reversis.

β. deflexis.

γ. incumbentibus.

δ. convolutis.

2. GEOMETRÆ. Larva octo vel decem-poda, pedibus pectoralibus 6, caudalibus 2, et interdum subcaudalibus 2; hirudinem instar incedans, dum quiescit, erecta, glabra, pupa apice acuminata; antennis filiformibus, articulis obsoletis; palpis duobus æqualibus, reflexis, membranaceis, cylindricis; lingua porrecta, membranacea,

Those whose larvæ are generally hairy, nearly cylindrical, and furnished with 16 feet; whose pupa is drawn to a point at the head; and which have their antennæ filiform and sharp at the tip; two feelers, equal, compressed, bent back, hairy and blunt; the tongue spiral, short, membranaceous, slightly projecting, filiform, blunt, and divided at the extremity.

a. *Attacos*, with spreading wings.

b. *Bombyces*, with wings not spreading.

α. Wings reversed.

β. deflected.

γ. incumbent.

δ. convoluted.

Those whose larvæ are smooth, and have eight or ten feet, six attached to the breast, two to the tail, and sometimes two more near to the tail; moving like a leech, and resting in an erect posture; whose pupæ are pointed at the head; which have filiform antennæ, with faint articulations, two feelers equal, bent back, mem-

braceous, bifida; alis inquietantibus, ut plurimum patulis, horizontalibus.

a. Alis angulatis, antennis ut plurimum pectinatis.

b. integris.

c. rotundatis.

3. TORTRICES. Alis obtusissimis, fere retusis, margine exteriori curvo; antennis filiformibus; palpis duobus æqualibus, nudiusculis, basi cylindricis, medio dilatato-ovatis, apice fetaceis; lingua porrecta, membranacea, fetacea, bifida; larva 16-poda, folia, quæ vorat, et intra quæ se recipit, filis contorquente, et connectente.

4. PYRALIDES. Alis conniventibus, in figuram deltoideam forficatam; antennis filiformibus, articulis obsoletis; palpis duobus æqualibus, reflexis, membranaceis, cylindricis; lingua porrecta, membranacea, fetacea, bifida; larva 14—16-poda.

5. NOCTUÆ. Larva 16-poda sæpius glabra, pupa apice acuminata, antennis fetaceis, palpis duobus compressis, pilosis, apice cylindricis, nudis; lingua porrecta, cornea, fetacea, bifida.

branaceous, and cylindrical; the tongue membranaceous, fetaceous, divided at the extremity, and projecting; the wings, when at rest, spreading horizontally.

a. Wings angular; antennæ, for the most part, pectinated.

b. entire.

c. round.

3. TORTRICES. Those which have their wings very blunt, with a curved exterior margin; the antennæ filiform; two feelers equal, nearly smooth, cylindrical at the base, dilated in the middle into an oval form, and fetaceous towards the tip; the tongue membranaceous, fetaceous, divided at the extremity, and projecting; and whose larvæ are furnished with 16 feet, and twist up the leaves on which they feed, by means of threads they spin, into a retreat for themselves.

4. PYRALIDES. Those which have the wings passing over one another, forming a forked figure resembling the Greek Δ; the antennæ filiform, with their articulations faintly expressed; two feelers equal, bent back, membranaceous, and cylindrical; the tongue membranaceous, fetaceous, divided at the extremity, and projecting; whose larva has from 14 to 16 feet.

5. NOCTUÆ. Those whose larvæ are for the most part smooth, and furnished with 16 feet; whose pupæ are pointed at the head, and have their antennæ fetaceous; two feelers compressed, hairy, with naked cylindrical tips; the tongue formed of a horny substance, fetaceous, divided at the point, and projecting.

a. Alis

- a. *Alis patulis.*
 b. *incumbentibus.*
 α. *Thorace lævi.*
 β. *crifato.*
 c. *Alis deflexis.*
 α. *Thorace lævi.*
 β. *crifato.*
- a. *Wings spreading.*
 b. *incumbent.*
 α. *Thorax smooth.*
 β. *crested.*
 c. *Wings deflected.*
 α. *Thorax smooth.*
 β. *crested.*
6. *TINEÆ.* Larva 16-poda, sæpius intra cucullum latente; pupa antierius acuminata; antennis fetaceis; lingua membranacea, fetacea, bifida.
6. *TINEÆ.* Those whose larvæ have 16 feet, and most commonly lie concealed under a covering; whose pupa is pointed at the head; and have the antennæ fetaceous, the tongue membranaceous, fetaceous, and divided at the extremity.
- a. *Tineæ,* palpis quatuor inæqualibus; larva sæpius rebus culinariis, vestimentis, pellibus, &c. visitante.
- a. *Tineæ,* with four unequal feelers; whose larva feed on clothes, hides, furniture, &c.
- b. *Tineæ,* palpis duobus ad medium bifidis, lacinia interiori acutissima.
- b. *Tineæ,* two feelers divided to the middle, the interior division very sharp.
7. *PTEROPHORI sive ALUCITÆ.* Alis digitatis abasin usque fissis; antennis fetaceis; palpibus tenuissimis, cylindricis, filiformibus, reflexis, nudis, apice subulatis; lingua porrecta, membranacea, elongata, fetacea, bifida; larva 16-poda, ovata, pilosa; pupa nuda apice, subulata.
7. *PTEROPHORI or ALUCITÆ.* Those which have their wings divided to the base into several portions; the antennæ fetaceous; two feelers, very slender, cylindrical, filiform, bent back, smooth, and tapering at the tip; the tongue membranaceous, fetaceous, divided at the extremity, projecting, and very long; whose larvæ are oval, hairy, and furnished with 16 feet.
8. *HAPIALI.* Larva 16-poda, subcylindrica, sæpius glabra, radicibus plantarum visitante; pupa folliculata, cylindrica, apice acuminata; antennis brevibus, moniliformibus; palpibus duobus æqualibus, obtusis, compressis, membranaceis, reflexis; linguæque bifidæ inter hos rudimento.
8. *HAPIALI.* Those whose larvæ are cylindrical, commonly smooth, furnished with 16 feet, and feed on the roots of plants; whose pupa is cylindrical, pointed at the head, and enclosed in a follicle; and have short, moniliform antennæ; two feelers, equal, obtuse, compressed, membranaceous, bent back, and the rudiment of a divided tongue placed between them.

* *Antennæ filiform.*

a. *Feelers compressed.*

† *Wings spreading.* Attaci.

Wings curved, of the same colour both on their up-*atlas*. per and under surfaces, variegated with yellow, marked with a transparent spot; the upper wings have a small transparent spot joined to the other. 1. Native of Asia and America; on the orange tree. Each articulation of the antennæ has two projections proceeding from them in opposite directions. The larva has hairy tubercles set round it in circles. It spins a large ball of silk, which is unravelled with very great difficulty.

Wings of a dark carnation colour; the under ones *niclitans*. marked with a rusty-coloured eye, the pupil of which is transparent. 469. Native of Africa. Female larger than the male.

Wings round, clouded with gray, and faintly marked with bands, adorned with a long semitransparent ocellus.

7. Native of Europe; on heath, bramble, the rose, the elm, the willow, and fruit trees. There are three varieties of this species, *minor*, *media*, and *major*. The antennæ in the male are more distinctly pectinated than in the female. The larva is gregarious, and green, having red and yellow hairy tubercles set round it in circles. The pupa is blackish, with a hole at the top of the follicle, which is elastic and acting like a valve.

Wings of a brick colour, adorned with an eye of a *tau*. violet colour; with a white spear-shaped pupil. 8. Native of Europe; on the birch. The larva green, marked on the sides with oblique white streaks, the back covered with knots. The pupa light-brown and hairy.

†† *Bombyces.* *Wings not spreading.*

a. *Wings reversed.*

Wings of a brick colour, notched, and marked with *populifera* a great many brown spots like crescents. 485. *Nalia*. Native of Europe; on the white poplar.

Wings notched, and of a rusty colour; the mouth *querciana* and shanks of the legs black. 18. Native of Europe; *folia*. on grass, the sloe, pear tree, apple, and willow. The larva is hairy, of a rusty colour, with a blue neck, and furnished with a slight tail. The pupa brown, marked with red bands.

Wings fawn coloured, marked with two whitish *rubi*. streaks on their upper surface. 21. Native of Europe; on the bramble and willow. The larva is hairy, black on the under side, and of a rusty colour, marked with black rings on the upper side. When young it is covered with a veil of black silk. The pupa blackish, marked with three yellow rings, and enclosed in a covering of silk.

Wings notched, yellow, and marked with two brown *pruni*. streaks and a white dot. 22. Native of Europe; on the plum. The larva is smooth, of an ash colour, marked with blue lines, and furnished with tufts of hair on the neck and along the sides; the hind legs are stretched out, and at a distance from one another. The pupa black on the fore part of the body, and of a light brown behind.

Wings faintly notched, and yellow, marked with a *potamo-* broad tawny stripe, and with two white dots. 23. *Naria*. tive of Europe; on grass. It produces oblong eggs of a leaden colour, marked at each end with a green ring, and with a green dot in the middle. The larva has a tail

tail and a crest, is hairy, and spotted on the sides with white. The pupa of a light brown.

* *quercus*. Wings of a rusty colour, marked with a yellow streak; the upper wings with a white dot. 25. Native of Europe; on heath, the sloe, the birch, the willow and oak. The colour of the female is paler than that of the male. The larva is hairy, gray, marked with black rings, and spotted with white. The pupa is enclosed in a thick covering of silk, is green, and brown on the fore part.

* *lanef-tris*. Wings of a rusty colour, marked with a white streak; the upper wings are white at the base, and marked with a white dot. 28. Native of Europe; on the lime tree, the sloe, and the willow. It produces eggs covered with ash-coloured wool. The larva is hairy and black; each of its segments is marked with three white dots between two red tufted spots. It is gregarious, and lives in habitations which it forms for itself composed of many cells; going out in quest of food, it returns through parallel holes. The pupa is of a sulphur colour.

* *vinula*. Wings nearly reversed, waved and streaked with brown; body white, dotted with black. 29. A native of Europe; on the willow and poplar. Larva solitary, green, and brown on the back, on which there is situated a turgid prominence; the tail is furnished with two bristles; it discharges an acrid fluid from a chink under its head. Pupa brown.

Silk-worm. Wings pale, marked with three faint brown streaks, and a brown circular spot. 33. Native of China and Persia; on the mulberry. It was introduced into Europe by Justinian. It varies a little in size and colour; the wings being sometimes yellowish, sometimes whitish. The larva is furnished with a tail, is naked, and whitish. The pupa light brown, enclosed in a thick silky covering, from which silk is manufactured. The first person who unravelled the cocoons of the silk-worm, and manufactured them into silk, was Pamphilia, a woman of Coos, the daughter of Latous, (*Vide* Plin. xi. 22.); *seu potius Platis filia*, (*Aristot. Anim.* v. 19.)

* *populi*. Brown and whitish on the fore-part; the wings brownish, marked with a whitish spreading stripe, with a small one placed close by it. 34. Native of Europe; on the poplar, and on fruit trees. The larva hairy, and of an ash-colour, darker on the back; each segment is marked with two pairs of red dots. The pupa is brown on the fore part, and reddish behind.

eucria. Wings yellow (in the female brown), marked with a white dot, and becoming paler towards the tip. 499. Native of Europe; on the sloe, &c. It deposits rough eggs in clusters. The larva gregarious, hairy, and light-brown. The divisions between the segments black, and marked on the sides with blue spots and sulphur-coloured dots. The pupa yellowish.

* *castrensis*. Wings dark-coloured, marked with two pale bands. 36. Native of Europe; feeds on the *pilosella*, *jacea*, *millefolium*, *alchemilla*, and *euphorbia*. It deposits its eggs in circles round branches. The larva is gregarious, consuming a great variety of vegetables: it feeds under a web, and frequently shifts its quarters: it is hairy, blue, and marked with red lines dotted with black. The pupa is dark-coloured.

* *procefsionca*. Wings of a brownish ash-colour: the female marked with one dark stripe; the male with three. 37. Native of Europe; on the oak. Of a middle size. The lar-

væ gregarious, hairy, of a brownish ash-colour, black on the back, and marked with yellow warts: they move in sets, differing in number. The skin which they cast excites inflammation when touched.

β. *Wings deflected.*

† *Tongue short.*

|| *Back smooth.*

Wings whitish, marked on the back with a brown *rufa*-spot, and with six brown spots like crescents on the lower wings. 508. Native of Europe. The under wings white, with a brown edge; the antennæ pectinated and brown; the legs brown.

Wings black, with white veins; the under wings * *planta-ginis*. yellow, with a black edge, and dotted with black. 42. Native of Europe; on the plantane, elm, and hyacinth. The under wings in the female are scarlet; but in the north of Europe, frequently white, with a black edge and black spots: when caught it emits a yellow drop from its collar. Larva hairy, black, with the back brown.

Wings white, waved with black, marked with blood-coloured rings between the segments of the abdomen. 43. Native of Europe; on the bramble, the willow, the apple, the oak, the larix, and other species of pine. To these last it is particularly destructive. Larva brownish ash-coloured, with red tufts on the back; the second segment of its body is marked with a black spot of a heart-shape. Pupa black.

Wings marked with spots clouded with gray and brown; the wings of the female whitish, with black stains. 44. Native of Europe; on the oak, the lime, and fruit trees; the pest of orchards. The female twice the size of the male, covers her eggs with balls of dust. The larvæ feed on a variety of vegetables, are hairy marked with white lines, dotted with blue on the fore part of the body, and with red behind. When touched they excite an itching in the hands. The pupa is marked on the fore part of the body with four black dots; when touched, it rolls itself up into a circle.

Wings of a snowy-white, a beard of a rusty colour * *chryso-rhæa*. at the anus. 45. Native of Europe; on the oak and fruit-trees. There is a smaller variety of this species with brownish wings in India. The female produces yellow eggs, and covers them with a large quantity of tawny-coloured wool. The larva is blackish, hairy, gregarious; not confined to one kind of food; marked with two red lines on the back, tufted with white on the sides. The pupa blackish.

||| *Back furnished with a Crest.*

Wings of an ash-colour, marked with three brown * *pubibun-* waved streaks. 54. There is a variety of this species, *da-* *scopularis* β. Antennæ pectinated, wings whitish, marked with three dark-coloured bands; the under wings white. It is a native of Europe; on the oak, beech, and fruit-trees. The larva is yellow, hairy; the tuft on the tail longer than the rest, and red; four tufts on the back, white; the head is pale yellow. The pupa is black in the lower part of the body, and a light brown behind, spotted with yellow.

Wings clouded; the posterior part of the thorax * *coffus*. marked with a black band; antennæ lamellated. 63.

A native of Europe; in decayed wood. The larva somewhat hairy, of a carnation colour; the head black, and back of a blood-colour. It was reckoned a delicacy by the Romans, who fattened it with flour. (Plin. xviii. 24.). The pupa of a light brown on the fore part of the body, and yellow behind.

ceraria. Wings yellowish, marked with black bands. 1306. A native of Chili; on a kind of *conyza*. The larva is naked, and red, while it undergoes its metamorphosis; it rolls itself up in a kind of wax, at first white and sweet, and afterwards yellow and bitter, which the natives gather in the autumn and put into cakes.

†† *Tongue long.*

† *a. Back smooth.*

* *aulica.* The upper wings gray, and dotted with yellow; the under ones tawny spotted with black. 68. A native of Europe; on the *angelica*, nettle, and grafs. The larva solitary, black, marked with white warts; on the upper part of the body it is covered with whitish hairs, and underneath with hairs of a rusty colour.

matronula. Wings brown; the upper wings gray, spotted with yellow on their superior surface; the under ones yellow marked with black bands. 92. A native of Europe; on the *artemisia vulgaris*.

b. *Back furnished with a Crest.*

oo. Wings of an ash-colour, streaked with a light brown, and marked with *oo*. 81. A native of Europe; on the oak. Larva naked, of a violet-colour, marked with white lines, and dots.

esculi. Of a snow white colour; wings marked with a great number of bluish-black dots; the thorax with six. 33. A native of Europe; in the wood of the pear and horse-chestnut. Larva yellow, dotted with black; head and tail black.

γ. *Wings incumbent.*

* *graminis.* Wings gray; marked with a white line dividing into three branches, and a white dot. 73. A native of Europe; on grafs. It varies in size, and is very destructive to pasture grounds. The larva consumes all kinds of grafs except the *alopecurus*. It is smooth, dusky, with a lateral and dorsal yellow stripe. It is destroyed by rooks and hogs. The pupa remains torpid for fourteen days only.

* *fuliginosa.* Wings dark-coloured, tinged with red, marked with a double black dot; abdomen red; and black on the back. 95. A native of Europe; on the turnip, mustard, grafs, and birch-tree. The larva is hairy, of a rusty colour, with black head and fore-legs; wanders over the snow in winter in Norway; and is said to forebode a cold summer and scarcity where it appears in considerable numbers. Pupa black, marked with yellow bands behind.

varella. Wings transparent and gray; antennæ brown. 591. A native of Europe; on the *vicia sylvatica*. The female deposits her eggs while in the pupa state, and never becomes a perfect insect.

δ. *Wings convoluted.*

hiario. Wings tawny, marked with numerous white spots, surrounded with blue. 593. A native of the island of

Tobago, Feelers white at the base, and tipped with black; thorax bluish black with white dots, and two tawny spots; abdomen beneath white with black rings; anus tawny; upper wings blue at the tip, with white dots; lower wings, and all beneath, black; the hind margin a little whitish.

§ § *Feelers cylindrical.* Geometræ.

a. *Wings angular.*

Wings green and faintly notched, marked with a *thymiaria*. faint waved whitish streak; a smaller line of the same description being placed contiguous to it. 199. A native of Europe; on thyme. Larva dark-coloured, marked with carnation-coloured spots on the back; the head and collar furnished with two little projections. Pupa light brown, marked with a black line, sharp-pointed before, and divided behind, and covered with a very thin follicle.

Wings ash-coloured, and marked with a rusty-coloured streak, and transverse row of black dots. 200. A native of Europe; on the oak. Larva ash-coloured, marked with yellow spots on the sides. Pupa of a pale carnation-colour above, beneath yellow; and is attached to a leaf.

b. *Wings entire.*

Wings green, somewhat waved, marked with a *papilionaria*. waved streak, and smaller streak of the same description contiguous to it. 225. A native of Europe; on birch-trees. Larva green, with ten crooked reddish prickles on the back. Pupa green, varied with yellow; remains torpid for 14 days.

Wing purple, marked with a pale fillet. 654. A *vittata*. native of Europe.

c. *Wings round.*

All the wings yellowish, marked with brown streaks, *atomaria*. and very small dots. 214. A native of Europe; on the *centaurea*. Larva gray, and smooth, marked with a number of interrupted lines of a rusty colour, having two tubercles on the posterior part of the body.

Wings white, marked with a striated yellow band; *pantaria*. the abdomen yellow dotted with black. 213. A native of Europe; on the elm and plane tree. Larva green marked with black lines; head and tail black. Pupa bluish.

Wings variegated with green and ash-colour, marked with two black streaks; the anterior one curved, the posterior one waved. 633. A native of Europe; on lichens. Small. Larva rough, varying in colour according to the colour of the lichen on which it feeds, green, ash-coloured, or yellow, spotted with black on the sides; the fore-legs marked with a black spot, and a green dot.

§ § § *Feelers almost naked, and cylindrical at the base; dentated in the middle, and oval; tapering at the tips.* Tortrices.

The upper wings green, marked with two oblique yellow streaks; the under wings white. 235. A native of Europe; on the alder and oak. Larva and pupa green: the former is marked along the side with a yellow line, and has the second segment of the back marked with tubercles; the latter marked on the back with a black line.

Wings

pomona. Wings clouded, the under ones marked with a reddish golden spot. 401. A native of Europe; on the apple. Larva naked, and red; with a black head. Pupa light brown.

resinaria. Wings brown, marked with a brown spot at the base, common to both wings, and with a triangular rusty spot at the tips. 406. A native of Europe. It takes up its habitation in a ball of rosin, which exudes from a wound made in the branches of the pine. Larva naked, and yellowish; head light brown. Pupa brown.

§ § § § Wings shutting closely, with the under edge of one over the upper edge of the other. Pyralides.

farinalis. Feelers bent backwards; wings yellowish and polished, marked with white waved streaks, yellowish at the base and tips. 327. A native of Europe; in flour and meal. It walks with its tail erect.

* *pinguinalis*. Feelers bent backwards; wings ash-coloured, thicker at the edges, faintly marked with black bands. 336. A native of Europe; on butter, bacon, &c. Very common in houses and kitchens, sometimes in the human stomach; the most pernicious of all the animals that live within the bodies of others. The larva smooth, brown, shining. Pupa naked, of a light brown.

secalis. Wings gray, streaked with brown, and marked with a kidney-shaped spot, on which there is inscribed a Roman A. 338. A native of Europe; within the stalks of rye, which it consumes within the sheath, going from one to another: this is the cause of the ears becoming white and empty. Larva green, marked with three longitudinal green lines; head light brown.

** *The Antennæ setaceous.*

§ Tongue projecting and horny. Noctuae.

a. Wings spreading.

odora. Wings notched, brown, and waved with black; the upper wings are adorned with a black eye, and marked with a blue spot like a crescent, and with a white spotted streak. 11. A native of Surinam.

strix. Wings of the same colour, both on the upper and under surface, reticulated and clouded with black and white. 82. A native of South America. Larva naked, black, and marked on the sides with a greenish line, and with green rings.

macrops. Wings indented; brown, waved with black; upper pair adorned with a large light brown eye. 968. A native of China. In some specimens, probably the females, the outer margin of the lower wings is reflected, forming a pouch which contains a great quantity of fine silk.

b. Wings incumbent.

a. Thorax smooth.

livida. Wings shining black; under wings of a rusty colour, edged with dark brown. 999. A native of Europe. Larva growing smaller towards each end, naked, greenish, variegated with yellow, and shining red, marked with a dark-coloured line on the back, and with a very slender pale one on the sides; the head of a pale colour.

VOL. VIII. Part I.

β. *The Thorax furnished with a Crest.*

Wings white, streaked with dark brown, dotted with *typha*. black on their posterior margin. 1005. A native of Europe; on the stalks of the *typha angustifolia*. It comes forth in August, about the size of *pinguinalis*, smooth and whitish. Larva is gray and naked. It undergoes its metamorphosis within the stalks, in the month of July.

Wings variegated with green and gray; the under ones reddish, marked with a band near the edge. 1009. A native of Europe; on the potato and bean, devouring the larvæ of other insects. Larva thick; wrinkled, and of an ash-colour. Pupa naked, and of a light brown.

Wings brownish gray, marked with a black spot; *C. nigrum*. white on the outer edge, and with a black line at the tip. 162. A native of Europe; on the common spinach. Larva variegated with gray and dark brown, marked on the sides with black cross lines, and with a single pale one.

c. Wings deflected.

a. Thorax smooth.

Wings whitish, marked with a very broad band of a trapezoid. darker colour, dotted with black along the edge. 99. A native of Europe on the hazel. Larva greenish, marked with ash-coloured, whitish, and sulphur-coloured lines: it devours the larvæ of other insects, and even of its own species. Pupa of a light brown; it lies dormant for four weeks.

Wings ash-coloured, without spots, marked with three *lucerna*. whitish waved streaks; the collar divided. 102. A native of Europe; frequently flying into candles, whence it has received its name; though many moths are attracted by the light, as well as this.

β. Thorax furnished with a Crest.

Wings ash-coloured; the upper wings marked at the base with a black line, and black characters; legs without spots. 135. A native of Europe; on the alder, oak, and fruit trees; varying in the number and figure of the characters. Larva hairy; back yellow; the sides spotted with black and red; a black erect horn on the thorax.

Wings yellowish, marked with two dark brown *turca*. streaks, and adorned with a yellowish eye. 140. A native of Europe; on the *juncus pilosus*, and in corn fields under stones. Larva reddish yellow, black at each end, underneath of a whitish yellow, marked on the back with a whitish line, and on the sides with a dark-coloured one; the divisions between the segments are marked with small black lines, and the head is dark brown. It gnaws over the stalks of the corn close by the ground, in the months of May and June.

The upper wings of a rusty colour, marked with a yellowish spot like a crescent, and with a white line divided behind. 171. A native of Europe; at the roots of cabbage, greens, &c. likewise on the leaves of peas and beans. Larva feeds on a variety of vegetables; naked, of a livid colour, dotted with black, and marked on the back with a dark brown line, and on the sides with a whitish one. Pupa naked and blackish.

Wings of a rusty colour marked with two spots, and *pisi*. with

B b

with a pale waved streak on their posterior part. 172. A native of Europe; on the pea and broom, confounding their pods. Larva naked, and of a rusty colour, marked with four yellow lines; head of a carnation colour. Pupa dark brown; the divisions between the segments of a blood colour.

tritici. Of an ash-colour; the wings marked with two pale-coloured spots, and with a single blackish one. 179. A native of Europe; on the ears of wheat and oats. Larva naked and yellow; marked with three white lines.

flavicornis. Upper wings of an ash colour, marked with three black streaks; antennæ yellow. 182. A native of Europe; on fruit trees. Larva naked, greenish, marked on the sides with white dots; head of a carnation colour.

§ § Tongue prominent and membranaceous. Tineæ.

a. Wings four, unequal.

cerella. Wings gray, emarginated behind; back of a dark brown, and furrowed. 282. A native of Europe; in bee hives, feeding on the wax.

padilla. The upper wings of a livid colour, and marked with 20 black dots; the under ones brown. 351. A native of Europe; on apple trees. The larva gregarious; living in swarms, under a common covering: it is naked, and gray, marked with a black dot on each side of its segments. Pupa yellowish.

* *pellionella.* Wings gray, marked in the middle with a black dot. 372. It is to be met with everywhere in woollen stuffs, which it destroys, lying concealed within a covering. Larva whitish, marked with a red line on the back. Pupa yellowish.

* *tapezella.* Wings black, under ones whitish; head pure white. 371. A native of Europe; on tapestry, furs, and skins, into which it gnaws holes.

* *fascitella.* Wings of an ash colour; thorax marked on each side with a white dot. 373. A native of Europe; in cloths and furs, which it destroys. It lies concealed under a covering.

* *mellonella.* Wings whitish, growing purple towards their exterior part, marked with a white streak; the scutellum black, and white at the tip. 375. A native of Europe; in bee-hives, where it penetrates the honey-combs. Larva is naked, and gray, with a light brown head. Pupa light brown.

* *proletella.* Wings whitish, marked with two dark brown dots; tongue bent inwards. 379. A native of Europe; on different species of cabbage; on the horned poppy; and on the oak. An individual, in the space of a year, may produce many millions, as they propagate every month, each depositing a great number of eggs.

b. Feelers divided the length of the middle, two in number.

* *granella.* Wings variegated with black and white; head very white. 377. A native of Europe; in granaries, where it destroys the grain and collects it into knots; it climbs up the walls of houses in winter.

§ § Wings divided into many divisions. Alucitæ.

* *didactyla.* Wings spreading and brown, marked with white streaks; the superior wings bifid; the posterior ones divided into three divisions. 454. A native of Europe; on the *geum rivale*, and on the *convolvulus*. Larva green,

covered with tufts of hair. Pupa long; with two lines of tubercles on the back, each furnished with four prickles.

*** Antennæ moniliform and short. Hepiali.

Wings yellow, with tawny streaks; the wings of the male of a snow-white colour. 84. A native of Europe; at the roots of the hop: the hop-planters manure with hogs dung, as a remedy against this troublesome insect; it deposits a very great number of eggs.

1529 species of this genus have been described in the last edition of the System of Nature.

IV. NEUROPTERA.

WINGS four; naked; their veins forming a net-work. Tail unarmed.

72. LIBELLULA, Dragon-Fly.

Mouth furnished with jaws. Jaws numerous. Lip divided into three. Antennæ shorter than the thorax; very slender and filiform. Wings extended. Tail of the male furnished with a hooked forceps.

* Wings spreading when the insect is at rest.

A. The central division of the Lip very minute.

The under wings marked at the base with a blackish spot; and all the wings marked on the middle of their upper surface with a blackish spot; the abdomen flattish and downy. 1. A native of Europe; in waters.

The under wings becoming black at the base; the body quadrangular. 4. A native of Europe; in fresh waters. The one sex is waved on the back with red, and the other with yellow.

All the wings black at the base; the abdomen depressed; the sides yellowish. 5. A native of Europe; in fresh water. The abdomen of the male bluish, marked on the sides, near the base, with yellow spots; the abdomen of the female brown, and yellow on the sides.

B. The divisions of the Lip equal. Æthnæ.

Abdomen yellow, marked with two black lines; the under wings yellow, marked with two black spots. 42. A native of China. Small: head yellow; eyes brown; thorax with yellow lines beneath; abdomen with two black lines above, and one beneath; upper ones black at the base, with a yellow spot.

Thorax black; marked with various yellow characters; tail furnished with crooked hooks. 11. A native of Europe.

* Wings erect when the insect is at rest; the Eyes distant from one another; the exterior division of the Lip slightly divided. Agriæ.

Wings coloured.

* *virgo.*

a. Body shining, greenish blue; wings bluish in the middle, the base and tip whitish, the margin without spots.

b. Body silky; wings bluish green, the tip brown, the margin without spots.

c. Silky,

c. Silky, green; wings brownish, with a white marginal dot.

d. Body silky; wings brown, gilt with a black spot. 20. A native of Europe; about fresh waters.

* puella.

Wings transparent.

a. Body red, with yellow and black lines at each segment; wings with marginal spots.

b. Body carnation colour; wings with a brown marginal dot.

c. Body alternately blue and ash-colour; wings with a black dot.

d. Body beneath bluish green, above brown; thorax with alternate brown and bluish bands; wings with a black marginal dot.

e. Body green, and pale carnation colour; thorax with three black lines; wings with a brown marginal dot. 21. A native of Europe; in almost endless variety.

This is an extremely ravenous tribe, and are generally seen hovering over stagnant waters. They copulate in the air, and fly about joined together. They fly very rapidly, and at a greater height than most other insects. The larvæ are six-footed; active; inhabitants of the water; furnished with articulated pincers, with which they seize and prey with the most rapacious ferocity on aquatic animals. The pupa resembles the larva, but has the rudiments of wings.

48 species of this genus have been described in the last edition of the System of Nature.

73. EPHEMERA, Day-Fly.

Mouth without jaws. Feelers four, very short, and filiform. The resemblance of a jaw, membranaceous, cylindrical, and connected with the lip. Antennæ short, and tapering towards the tip. Two large stemmata above the eyes. Wings erect, under ones very small. Tail bristly.

These short-lived animals are found everywhere about waters in the summer, and in their perfect state seldom live above a day, during which time they perform all the functions of life. They remain in the state of larvæ and pupæ for one, two, or three years. The larva lives under water, and is eagerly sought after by fish, particularly by trout, for which it forms an excellent bait. They are furnished with six feet, a tail, and six fins which serve them as oars. The pupa resembles the larva, except in having the rudiments of future wings. They scoop out holes for themselves in the banks of rivers, formed like siphons; the one leg serving as an entrance, the other as an outlet. The banks of some rivers are often perforated with them. When the waters decrease, they form fresh holes lower down. The ephemeræ on the Rhine appear two hours before sunset; they come forth almost all at the same time, and in immense numbers. Those on the Marne and Seine, in France, do not begin to fly till two hours after sunset. The females, by the help of the threads of the tail, and the flapping of their wings, support themselves on the surface of the water, and in almost an upright position, drop their eggs in clusters. A female will drop seven or eight hundred eggs, which sink to the bottom.

* Tail furnished with three bristles.

Wings reticulated and spotted with brown; body brown. 1. A native of Europe; in fresh waters. In the month of June, they are to be seen in the evenings fluttering about under trees in innumerable swarms. In the neighbourhood of Laz in Carniola, they abound so much, that the country people collect them for manure; the peasant who has not collected to the amount of twenty cart loads, thinks himself unfortunate.

Wings white, the outer margin brown; body black. * *marginata*.

3. A native of Europe. Wings black, the under ones whitish. 4. A native * *vespertina* of Europe; in fresh waters.

** Tail composed of the two bristles.

Wings white, and reticulated; the head marked with two yellow tubercles. 5. A native of Europe; in fresh waters. The bristles of the tail white dotted with brown, and longer than the body.

Wings white, the edges blackish and thicker than the rest of the wing. 9. A native of Europe; in fresh waters. * *horaria*.

18 species of this genus have been described in the last edition of the System of Nature.

74. PHRYGANEÆ.

Mouth furnished with a horny mandible, short, arched and sharp, without teeth. Jaw membranaceous. Feelers four. Stemmata three. Antennæ setaceous, and longer than the thorax. Wings incumbent, the under ones folded.

These insects are seen in a summer evening floating in the air in great numbers, and are eagerly devoured by swallows; they are easily distinguished from the smaller moths, by their wanting the spiral tongue. The larva is six-footed, found at the bottom of shallow waters enclosed in a tube, constructed of sand, straws, or small chips of wood, and is known to fishers by the name of *caddy* or *caddo*, who use it as a bait for trout, after they have taken off the tube with which it is covered. When about to become a pupa, it shuts up the mouth of its tube with a few loose threads of silk, of the same nature with that by which it connects the straws and chips that compose its tube. The larvæ of the species which compose the first division have one or three tails, which serve them for fins; the pupæ have six feet, and prominent horny jaws. The larvæ of the other species are somewhat hairy, furnished with two hooks at the tail, and with three tentacula on the fourth segment. The pupa very much resembles the perfect insect.

* Jaw divided. Tail formed of two bristles, and terminating abruptly. *Semblis*.

Wings marked with many veins, forming a net-work. * *bicaudata*. 1. A native of Europe, in fresh waters; carrying about its eggs in a mass under its belly; body greenish.

Body black; wings white, spotted with black. 3. * *halenoides*. A native of Europe.

** Tail without bristles; the jaw joined to the lip.

reticulata. Body black; the wings of a rusty colour, reticulated with black. 4. A native of Europe.

* *grisea*. Body gray; the upper wings clouded, and marked with a black spot on the edge. 6. A native of Europe; in fresh waters. The larva is covered with a tube composed of grass and rushes.

* *grandis*. Wings of a brownish brick-colour, marked with ash-coloured spots. 7. A native of Europe; in fresh waters. The larva is concealed in a cylindrical tube formed of chips of wood.

* *rhombica*. Wings gray, marked with a white rhomboidal spot. 8. A native of Europe; in fresh waters. The larva is lodged within a cylindrical tube, formed of bits of grass, connected together transversely.

50 species of this genus have been described in the last edition of the System of Nature.

75. HEMEROBIUS.

Mouth furnished with a short horny mandible. Jaw cylindrical, straight, and cleft. Lip prominent and entire. Feelers four; projecting, unequal, and filiform. No stemmata. Wings deflected, but not folded. Antennæ fetaceous, projecting, and longer than the thorax, which is convex.

Like the *ephemera*, these insects are very short-lived; and in every state of their existence, they prey with unceasing avidity upon *aphides*. The larva is six-footed, generally oval and hairy. The pupa commonly folliculated. The eggs are deposited in clusters on the leaves of plants; each placed on a small stalk made of gum. Many of them, when touched, have an excrementitious smell. The follicle in which the pupa is enclosed, is of a dense texture, formed of whitish silk. In summer, at the end of three weeks, the *hemerobius* comes forth a perfect insect. When the follicle has not been formed till the end of autumn, the pupa remains in it the whole winter; and does not undergo its final metamorphosis till the ensuing spring.

A. Lip cylindrical, membranaceous, and marked with rings. Semblides.

* *lutarius*. Black; wings whitish, streaked and spotted with white. 14. A native of Europe; in fresh waters; very common in the spring. It deposits a great number of light brown eggs, which it attaches in clusters to the leaves of aquatic plants by means of a glutinous matter.

B. Lip horny, round at the tip, and arched.

perla. Yellowish green; wings transparent, and marked with green veins. 2. A native of Europe; on vegetables. Its eggs are set on capillary stalks.

mellano-tictos. Yellowish; wings transparent, variegated with blue and gold, marked with whitish veins, dotted, and somewhat hairy, the edges marked with very small black dots. 31. A native of Europe.

versicolor. Yellow; wings transparent, variegated with blue and gold; the base of the abdomen, the under-part, and

anus black; the antennæ yellow. 32. A native of Europe.

31 species of this genus have been described in the last edition of the System of Nature.

76. MYRMELEON, Lion-ant, or Ant-eater.

Mouth with a sharp horny jaw, and mandible. Lip projecting. Feelers six. No stemmata. Antennæ thicker towards their outer edge. Wings deflected. Tail of the male armed with a pair of pincers, composed of two filaments nearly straight.

A. The posterior Feelers much longer than the rest; jaw furnished with one tooth; Lip membranaceous and square, terminating abruptly, and emarginated.

The insects of this family prey with the most savage ferocity upon ants, and lesser insects; and for the purpose of ensnaring them sink themselves into the sand, and form a kind of funnel or pit in which they lie buried, the head only appearing above the sand: into this hollow such insects as wander near it are sure to fall; and not being able to crawl up the sides of loose sand, are seized and devoured by the *lion-ant*. But if the sides of the pit do not give way, or the unlucky insect appears to be able to make its escape, its enemy, by throwing up with its head repeated showers of sand, forces it down till it comes within its reach. Larva is six-footed, oval and hairy, with exerted toothed jaws. Pupa enclosed in a ball composed of agglutinated sand or earth.

Wings clouded with brown, marked with a white *formica*-spot on their posterior margin. 3. A native of Europe. The larva goes backwards; frequents sandy places, where it digs pits to ensnare other insects.

B. Feelers nearly equal, and filiform; the jaw fringed; Lip horny, round and entire.

The upper wings transparent, marked at the base *longicornis* with a double yellow spot; the under wings are yellow, and black at the base. 2. A native of Europe. Head black and hairy.

Wings white, marked with a black spot at the edge; *australis*. body variegated. 14. A native of Europe. Variegated with brown and yellow; the antennæ of the same length with the body, and black; club oblong.

15 species of this genus have been described in the last edition of the System of Nature.

77. PANORPA, Scorpion-fly.

Mouth stretched out into a cylindrical snout, composed of a horny substance. Mandible, without teeth. Jaw divided at the point. Lip very long, covering the whole mouth, and like it formed of a horny substance. Feelers four, nearly equal. Antennæ filiform, and longer than the thorax. Tail of the male notched, of the female unarmed.

Wings equal, spotted with black. 1. A native of *communis* Europe; lives chiefly on dipterous insects.

Wings tapering towards the point, somewhat curved *hyemalis*. and fringed; female without wings. 3. A native of

Europe. It is common when winter disappears. It is of a brownish yellow colour above.

10 species of this genus have been described in the last edition of the System of Nature.

78. RAPHIDIA.

Mouth furnished with an arched mandible set with teeth. Jaw cylindrical and obtuse; lip round and entire; all of them formed of a horny substance. Feelers four, very short, nearly equal, and filiform. Stemmata three. Wings deflected. Antennæ filiform, the same length of the thorax, which is lengthened out at the anterior part, and cylindrical. Tail of the female furnished with a loose curved bristle.

* *ophiopsis*. Wings without spots. 1. A native of Europe; in pine forests; feeding on other insects. Larva has six feet. The pupa active, very like the perfect insect in every point, except that it wants wings.

* *notata*. Wings marked on the edge with a brown spot. 2. A native of Britain. Black; a reddish brown spot on the head and legs, and furnished with a projecting sting of the same length with the abdomen.

V. HYMENOPTERA.

WINGS four, membranaceous for the most part. Tail of the female furnished with a sting.

79. CYNIPS, Gall-fly.

Mouth with a short jaw, furnished with one tooth, and membranaceous. The mandible arched, cleft at the tip, and with a short, cylindrical, and entire lip, all composed of a horny substance. Feelers four, short, unequal and capitated. Antennæ moniliform. Sting spiral, and for the most part concealed.

The numerous excrescences or galls, found on the roots, branches, and leaves of various trees, are produced by the puncture of these insects. The larva is without feet, soft, cylindrical, and inhabits within the gall, feeding on the juices of the tree. The pupa resembles the perfect insect, except in having only the rudiments of wings.

ascendens Of a brazen colour; the abdomen conical, ascending and joined to the trunk by a very narrow connection. 20. A native of Europe. Large; legs of a pale colour; the thighs black at the base.

* *roseæ*. Body black; the abdomen of a rusty colour, and black behind; the legs of a rusty colour. 1. A native of Bedeguar; on the rose.

* *quercus baccarum*. Black; base of the antennæ and legs yellowish. 4. A native of Europe. Forms roundish and transparent galls, about the size of a pea, on the under surface of the leaves of the oak; and comes out about the middle of summer.

* *quercus folii*. Black; thorax marked with lines; legs gray; thighs beneath black. 5. A native of Europe. Forms galls about the size of a hazel nut, on the under surface of the leaves of the oak.

* *quercus infera*. Black; antennæ and legs pale. 6. A native of Europe. Forms globular, opaque, red galls, about the size of a hazel nut, on the under surface of the leaves of the oak.

Black; legs white; thighs brown. 7. A native of * *quercus* Europe. Forms hollow galls, convex at each end, on *petioli*, the footstalks of the leaves of the oak.

Gray; wings marked with a linear cross. 8. A * *quercus* native of Europe. Forms granulated connected galls, *pedunculati* on the male flowers of the oak.

In galls on the bark of the oak. 9. A native of * *quercus* Europe. Forms a cup-shaped gall, the disk convex and *corticis*, surrounded with about twenty concave dots, sunk into the bark of the oak.

Pale; abdomen and eyes black. 10. A native of * *quercus* Europe. Forms white woolly galls on the small *ramuli* branches of the oak.

In the terminal bud of the *quercus robur*. 11. A * *quercus* native of Europe. Found in the large imbricated galls *gemmae* on the terminal buds of the *quercus robur*. This fly is of a very dark green, slightly gilded. Its antennæ and feet are of a dun colour, rather deep. It deposits its eggs in the oak buds, which produce one of the finest galls, leaved like a rose-bud beginning to blow. When the gall is small, the leaves are compressed, and lie over one another like the tiles on the roof of a house. In the centre of the gall there is a kind of hard nucleus, in the middle of which is a cavity, and in that is found the little larva, which feeds there, takes its growth, undergoes its metamorphosis, and breaks through the inclosure in order to get out. The whole gall is often near an inch in diameter, sometimes more when dried and displayed, and is attached to the branch by a footstalk. (Barbut, Insect, p. 233.)

On the calyx of the oak and *ægilops*. 18. A native *quercus* of Europe. Forms galls on the calyx of the *quercus calicis robur*, sometimes used by tanners. They were called by the Romans *cerri*.

Black, without spots. 12. A native of Europe. * *fagi*. Forms galls of the shape of a pear, on the upper surface of the leaves of the common beech.

Body brown. 22. Forms tenacious globular galls, *rosmarini*, about the size of a hazel nut, filled with clear oil, on the branches of the *rosmarinus chilensis*.

Body black; the base of the antennæ and legs of a brick colour; the abdomen lengthened out into a broad tail. 25. It is lodged at the top of the stalk of the *arundo fragmitis*, which becomes dilated, and grows no higher.

28 species of this genus have been described in the last edition of the System of Nature.

80. TENTHREDO, Saw-fly.

Mouth furnished with an arched mandible, formed of a horny substance, and notched in the inside. Jaw straight and blunt at the tip. Lip cylindrical and divided into three. Feelers four, unequal, and filiform. Wings plain and swelling out. Sting composed of two serrated laminæ, slightly projecting. Scutellum marked with two grains placed on its surface, at a distance from one another.

The male and female of many of the species of this genus vary in colour. They feed on the leaves of various plants; the female uses her sting in the manner of a saw, and cuts out spaces in the twigs or buds of trees, for the purpose of depositing her eggs: larva cylindrical, soft, with sixteen or twenty-eight feet; feeds on the leaves

leaves of plants, and when touched rolls itself up spirally. Pupa enclosed in a follicle, and is very like the perfect insect; the eggs increase in size every day till the larvæ burst from them.

* *Antennæ clavated.*

* *femorata.* Antennæ pale yellow; body black; thighs of the hind-legs very large. 1. A native of Europe; on the alder and willow. Larva green, marked on the back with a blue line, and on the sides with a yellow one.

* *triflis.* Body black; antennæ pale yellow; wings brown at the tips. 56. A native of the Sundmore islands. Larva green, marked on the back with a blue line fringed with black and yellow.

* *vitellina.* Abdomen black above, reddish on the sides; the thighs of the hind-legs dentated. 5. A native of Europe; on the birch and willow; the antennæ yellow, and black at the tip. The larva is green, and spouts water from an opening a little above the anus.

** *Antennæ without articulations, and thicker towards their outer edge.*

* *enodis.* Antennæ smooth: body of a bluish black. 11. A native of Europe; on the willow. Larva green, dotted with black, marked on the sides with a wrinkled yellow line, and furnished with an acute tail.

* *usulata.* Body black; abdomen bluish; shanks of the legs pale. 13. A native of Europe; on the *rosa canina*. Wings of a faint rusty colour, marked with a brown spot. Larva green, marked with two white lines; the head of a brick-colour, marked with a dark-coloured band.

* *cyanocrocea.* Head and thorax bluish: the abdomen of a saffron-colour. 6. A native of Britain; on umbelliferous plants: antennæ black; legs of many colours.

*** *Antennæ pectinated.*

* *cephalotes.* Body black; abdomen marked with four yellow belts. 64. A native of Europe; large; head large, three dots situated between the eyes; the thorax marked on the fore part with an interrupted yellowish streak; legs of a rusty colour.

* *dorsata.* Body whitish; head and back of the thorax and abdomen black. 65. A native of Britain; antennæ black.

**** *Antennæ feathered.*

* *pini.* Antennæ spear-shaped; the thorax somewhat hairy. 14. A native of Europe; very common in the fir-tree. The male black; the thighs and shanks of the legs of a tawny colour: female twice the size of the male; gray; antennæ serrated. Larva blue, and of a tawny colour at each end.

***** *Antennæ filiform; furnished with seven or nine articulations.*

* *rustica.* Body black; the abdomen marked with three yellow belts; the posterior pair being interrupted. 16. A native of Europe; on the woodbine. Mouth whitish; the scutellum and thorax marked with a yellow spot; the legs yellow; the knees of the hind-legs black.

Larva of an ash-colour, marked with triangular light brown dots on the back.

Greenish yellow; legs tawny; the thighs of the *cynipifor*-hind-legs of a brass colour. 69. A native of Europe; *mis*. in the pods of the vetch; about the size of a black ant; the thorax lengthened very much, resembling a *cynips*. Female bluish green, with a metallic lustre.

Body variegated. 21. A native of Europe; on * *salicis*. the poplar and willow. Larvæ feeding in parallel troops; flat, rough, yellow, and marked on each side with two rows of black dots; head black.

Body black; head and thorax red. 29. A native * *alni*. of Europe; on the leaves of the alder. When looked at, it attempts to conceal itself. The antennæ are black; the abdomen black, with a violet gloss; the fore-legs reddish brown.

Body black; belly, legs, and scutellum whitish. 35. *rapæ*. A native of Europe; on the leaves of the turnip. Small; whitish beneath; the edges of the wings black; the edges of the segments of the abdomen faint yellow; head and thorax variegated with white.

Body yellow; head and upper part of the thorax * *caprea*. and abdomen black; wings marked with a yellow dot. 55. A native of Europe; on the willow and corinth. The larva yearly destroys the gooseberry and red corinth, but does not injure the black corinth; blue; the three first and three last segments tawny, marked with nine lines of dots.

Body black; the shanks and apophyses of the thighs *ribis*. of the hind-legs are white on their exterior side. 88. A native of Europe; on the red corinth. The larva destroys the edges of the leaves of the red corinth; it is green; the head edged with black; body wrinkled; six feet situated on the breast, are furnished with hooks; six on the abdomen are set close together, and two near the tail resemble papillæ.

***** *Antennæ setaceous, composed of many articulations.*

Body blue; head red. 40. A native of Europe; on * *erythro*-the common pine. Male black; the mouth and shanks *cephala*. of the fore-legs pale yellow.

Black, with a tinge of blue; mouth, feelers, and *populi*. shanks of the legs yellow. 44. A native of Europe; on the poplar; wings brownish; the breast variegated with pale yellow on each side, edged with bright yellow; the abdomen pale yellow; spotted on the back with black.

***** *The following species, and other five, seem doubtful.*

Black; legs yellow; antennæ slightly clavated. 50. *intercus*. A native of Europe; on the leaves of the burdock, the nightshade, and the *vulvaria*; it is lodged under the cuticle of the leaf; the antennæ shorter than the body, transparent and deeply articulated; the abdomen oval and pointed.

140 species of this genus have been described by Gmelin, in his last edition of the System of Nature.

81. SIREX, *Tailed Wasp.*

Mouth furnished with a thick mandible, composed of a horny substance, terminating abruptly at the tip; the

the jaw bent inwards, pointed, cylindrical, and fringed, which, together with the lip, is membranaceous, short and entire. Feelers four; the posterior ones longer than the rest, and thicker on the outside. Antennæ filiform, composed of upwards of 24 articulations. Sting projecting, rigid, ferrated. Abdomen closely attached to the trunk, terminating in a sharp point. Wings lance-shaped and plane.

The larvæ of this genus are six-footed, soft, and cylindrical; the head rounded: they perforate wood, and frequently eat their way into the bowels of other insects and their larvæ, particularly caterpillars, living upon and consuming their vitals: pupæ folliculated. The perfect insect lives on the nectar of flowers.

* *gigas*. Body black; the abdomen yellow at the base and at the extremity. 1. A native of Europe; on fir trees.

* *spectrum*. Abdomen black; thorax hairy, with a pale yellow mark before the wings. 3. A native of Europe; in decayed timber, particularly fir wood.

phantoma. Abdomen yellow above, marked with black rings; head and legs pale yellow. 12. A native of Europe; mouth, thorax, and under part of the abdomen black.

18 species of this genus have been described in the last edition of the System of Nature.

82. ICHNEUMON.

Mouth furnished with a jaw, straight, membranaceous, roundish at the tip, divided, expanded, and fringed; the mandible arched, sharp, and smooth; and with a lip cylindrical, membranaceous at the tip, and margined. Feelers four, unequal, and filiform; situated in the middle of the lip. Antennæ setaceous, furnished with upwards of 30 articulations. Sting prominent, furnished with a sheath composed of two valves.

The whole of this singular genus are parasitical, deriving their nourishment from other insects. The fly feeds on the nectar of flowers; and when about to lay her eggs perforates the body of some other insect or its caterpillar, with its string or instrument at the end of the abdomen, and there deposits them; these, after being transformed into larvæ, prey upon the intestines of their foster parents till they are metamorphosed into pupæ. The larva is without feet, soft, and cylindrical; pupa sometimes naked, sometimes covered with a follicle. It is a species of this genus which produces the animal cotton, of which M. Baudry des Lozieres gives an account (Vide *Second Voyage à la Louisiane, par Baudry des Lozieres*). A worm of considerable size, which Baudry calls *fly-carrier*, (well known to planters as the *manioc* or indigo worm,) is at one period of the year, attacked by swarms of the *ichneumon fly*, which deposit their eggs in every pore of the worm. The insects are produced all nearly at the same time, and spin each of them a minute covering for itself. The *manioc* worm is now covered with a white case, which he with considerable difficulty shakes off, and, in a few days, the insects are again hatched from it, but in the form of flies, leaving the animal cotton behind them. This production is very abundant, as M. Baudry could collect fe-

veral bushels of it in a short time. In his opinion, it possesses many advantages over the vegetable cotton.

A. *Scutellum whitish; the Antennæ marked with white rings.*

Scutellum white; the thorax without spots; the second, third, and fourth segments of the abdomen pale yellow; the rest white at the tip. 2. A native of Europe; the thighs of the four hind-legs black.

Black; the scutellum, the extremity of the abdomen, and a notched band on the anterior part of the abdomen, yellow; the legs, and connection between the abdomen and trunk likewise yellow. 221. A native of Italy. It forms cells composed of cemented clay, in chimneys and windows, arranged commonly in parallel rows, forming a cylindrical nest, each containing a brown, lucid follicle, in which the larva is lodged, together with the body of a spider in which the egg had been originally deposited. The upper wings are dark-coloured towards the tip.

B. *Scutellum whitish; Antennæ totally black.*

Black; the scutellum whitish; the divisions between the segments black; the second, third, and fourth segments, as well as the legs, are yellow. 90. A native of Europe. In the pupa of the *phalæna piniperda*.

Black; the scutellum yellowish; the under part of the antennæ reddish; the thorax armed on each side with a prickly; the abdomen black, marked with yellow belts; anus yellow. 198. A native of Britain.

Scutellum white; the thorax spotted; abdomen black; the base of the second segment, the third and sixth segments yellow. 93. A native of Britain.

C. *The Scutellum and Thorax of the same colour; Antennæ marked with rings.*

Black; the abdomen of a rusty colour, and black at the extremity. 116. A native of Europe.

Black; legs reddish; the feet of the hind-legs white at the tips. 199. A native of Britain. It smells of musk.

D. *The Scutellum, and Thorax of the same colour; Antennæ black.*

Body and wings black, marked with a transparent spot like a crescent; abdomen scarlet. 28. A native of Britain; in gardens.

Black; legs reddish; the flanks of the hind-legs black, marked with white rings. 40. A native of Europe. In the larva of moths, particularly in the *phalæna turionelle*. Antennæ of the same length with the body; the sting shorter than the abdomen.

Black; mouth and legs reddish; the abdomen joined to the trunk by a stalk, or narrow connection. 33. A native of Europe. In the pupæ of some species of butterfly.

Black; the abdomen curved like a scythe, reddish in the middle; the thighs of the hind-legs clavated; white at the base and at the extremity. 52. A native of Europe; in the larvæ of the bee and of the *sphex*. Having examined with its antennæ, where the *sphex* is, and

and having discovered it, it flies away, and returns and places its egg on it.

E. *Antennæ pale yellow.*

venosus. Entirely yellow, except some black between the stemmata; wings white, with yellow veins. 354. A native of Europe.

cinclus. Black; antennæ and legs of a rusty colour; wings transparent, marked with a black speck. 60. A native of Europe; in gardens.

F. *Minute, with the Abdomen closely attached to the Thorax.*

gregarius. Black; the legs and sides of the abdomen of a rusty colour. 204. A native of Europe; in the larvæ of butterflies; gregarious, and very frequent in the spring. Soon after they are hatched they spin each of them a white follicle for themselves, which are connected together in a cluster, from which they come forth perfect insects.

* *bedeguaris.* Shining green; abdomen golden-coloured. 63. A native of Europe; in the larvæ of the *cynips*, which produces the galls on the rose and the oak. The sting the same length with the body.

* *gallarum.* Of a bronze colour; abdomen black; shanks of the legs whitish. 64. A native of Europe; on the larvæ of the *cynips*, which produces the galls on the branches of the oak.

puparum. Body blue and gold; abdomen shining green; the legs pale. 66. A native of Europe; in the larvæ of flies and butterflies.

cynipis. Green and gold; the abdomen brown, marked with a pale-coloured belt at the base; legs yellowish. 68. A native of Europe; on the larvæ of the *cynips*, and on the pupæ of butterflies.

globatus. Black; legs of a rusty colour. 74. A native of Europe; in stalks of grain, within a roundish follicle, composed of white silk, common to a number of the insects.

* *glomeratus.* Black; legs yellow. 75. A native of Europe; in the larvæ of butterflies. Soon after they are hatched, they spin each of them a yellow follicle for themselves; they deposit their eggs on the pupæ of butterflies soon after they have changed from larvæ.

418 species of this genus have been described in the last edition of the System of Nature.

83. SPHEX.

Mouth furnished with an entire jaw; the mandible curved, notched, and formed of a substance like horn. Lip horny, and membranaceous at the tip. Feelers four. The antennæ in some species have upwards of 10 articulations. Wings in each sex incumbent and not folded. Sting pungent and concealed within the abdomen.

The insects of this genus are the most savage and rapacious of this class of animals; they attack whatever insects come in their way, and by means of their poisonous sting overcome and devour such as far exceed themselves in size; when they attack any insect, they give one stroke, and fall down as if dead, and quietly

wait till the poison they have infused through their sting produce its effect. Their prey either serves as food for themselves or their young. Those of the division B are to be found chiefly on umbelliferous plants; the larva is without feet, soft, and inhabits the body of some other insect, on the juices of which it feeds; the pupa has only the rudiments of wings; the perfect insect deposits her eggs in the bodies of other insects.

A. *Antennæ setaceous; Lip entire; Tongue wanting.*
Evanixæ.

Body black; the abdomen very short, and attached to the back part of the thorax by a foot-stalk. 12. *gaster.* A native of Europe, America, and Africa. Sprinkled with concave dots; the thorax flattened behind; the abdomen oval, compressed and very smooth; wings transparent, short, and deflected.

B. *Antennæ filiform; the Lip emarginated, and furnished with a bristle on each side; Tongue bent inwards, and divided into three divisions for almost half its length.*

a. *Abdomen attached to the trunk by a stalk or narrow communication.*

Black, hairy; the attachment of the abdomen to the trunk furnished with two articulations; the second and third segments of the abdomen of a rusty colour. 1. A native of Europe; on sandy ground, where it digs a hole with its fore-feet, like a dog, in which it buries the larva of a moth, on which it deposits an egg, and then shuts up the hole. The abdomen exceeds the wings in length about one half, and in the male is black on the back.

Smooth, black; the lip and the edges of the segments of the abdomen lucid. 11. A native of Europe; in holes of wood, in partitions, which have been formed and abandoned by other insects: these it cleanses by gnawing round them; and placing a piece of moist clay at the bottom, sticks a spider upon it. In the body of this spider it deposits its eggs, and then closes up the entrance with clay. The larva is pale, and very like the larva of the bee. Having consumed the spider, which had been enclosed along with it, it spins a yellowish brown membrane for itself, exactly adapted to its body. One female spheX forms a great many nests; she spends no more than two days in forming any one.

Body black; fore-head, mouth, scutellum, and two bands on the abdomen, yellow. 98. A native of Italy; breeds in chimneys and in windows, in the same nest with the *ichneumon seductor*. It is about seven lines long, dotted; the shanks of the legs yellowish, and black at the extremities; wings transparent and dark-coloured at the tips.

b. *The Abdomen closely attached to the Thorax.*

Downy and black; wings brown; the anterior part of the abdomen of a rusty colour, marked with black belts. 15. A native of Europe; in sandy ground: it digs holes in the sand, in which it buries the larva of a moth, after it has deposited an egg on it.

Body black; the fore part of the thorax furnished with

with a prickle on each side; the lip and the breast of the colour of silver. 86. A native of England; smooth; wings transparent; legs reddish.

98 species of this genus have been described in the last edition of the System of Nature.

84. SCOLIA.

Mouth furnished with a curved sharp mandible, crenated on the inside. Jaw compressed, projecting, entire and horny. Tongue inflected and divided into three at the tip, very short. Lip projecting, membranaceous at the tip, and entire. Feelers four, equal, short, filiform, and situated in the middle of the lip. Antennæ thick and filiform; the first joint longer than the rest.

Sexmaculata. Hairy, black; the abdomen marked with three pair of yellow spots. 6. A native of Europe; marked with a yellow spot both before and behind the eyes.

quadripunctata. Body black; the abdomen marked with four white dots, the wings of a reddish brown. 22. A native of Europe.

27 species of this genus have been described in the last edition of the System of Nature.

85. THYNNUS.

Mouth formed of a horny substance; the mandible incurved. The jaw short, and straight. Lip longer than the jaw, membranaceous at the tip, and divided into three, the middle division emarginated. Tongue very short and involuted. Feelers four, equal and filiform. Antennæ filiform.

dentatus. Abdomen black; the second, third, and fourth segments marked with two white dots. 1. A native of New Holland. Likewise the first segments are marked with a white dot on the sides.

13 species of this genus have been described in the last edition of the System of Nature.

86. LEUCOPSIS.

Mouth composed of a horny substance, and furnished with short jaws. The mandible thick, and furnished with three teeth at the tip. Lip longer than the jaw; membranaceous and emarginated at the tip. Feelers four, short, equal, and filiform. Antennæ short, straight, and clavated. Thorax furnished with a lance-shaped scale on its under side. Sting bent backwards, and concealed in a groove in the upper part of the abdomen.

ælogaster. Abdomen attached closely to the trunk; scale of the thorax half the length of the abdomen. 2. A native of Europe; eyes black; forehead without spots; the posterior part of the thorax marked with a yellow fillet, and without dots. Small than the common wasp.

Three species of this genus have been described in the last edition of the System of Nature.

VOL. VIII. Part I.

87. TIPHIA.

Mouth furnished with a membranaceous rounded jaw. The mandible arched, and acute. The lip short, furnished with three small projections, and composed of a substance like horn. No tongue. Feelers four, filiform, unequal, projecting, and situated in the middle of the lip. Antennæ filiform and arched.

Black; the thighs of the four hind-legs angular and reddish. 4. A native of England.

Black; thorax spotted; abdomen marked with five yellow bands, the second interrupted. 6. A native of Europe, chiefly in England.

17 species of this genus have been described in the last edition of the System of Nature.

88. CHALCIS.

Feelers four, and equal. Antennæ short, cylindrical, and spindle-shaped; the first articulation a little thicker than the rest.

Shining black; the thighs of the hind-legs thickened, and marked with a white dot at their extremities. 6. A native of Europe. Feet white.

7 species of this genus have been described in the last edition of the System of Nature.

89. CHRYSIS. *Golden-fly.*

Mouth composed of a horny substance, and projecting; is furnished with a linear jaw, and with a lip emarginated, and membranaceous at the tip, and much longer than the jaw. No tongue. Feelers four, projecting, unequal, and filiform. Antennæ short, and filiform; the first articulation longer than the rest. Body gilt and shining. Abdomen arched beneath, furnished with a scale on each side. The anus (in most of the species) is furnished with small projections. Sting is slightly projecting. Wings plane.

The insects of this genus commonly form their nests in holes made in walls.

Smooth, polished; the thorax green; the abdomen of a golden colour, and furnished with four small projections at the extremity. 1. A native of Europe; in walls.

Smooth, shining; the thorax green; the abdomen of a golden colour; the anus furnished with two small projections. 4. A native of Europe; in walls.

Smooth, shining; the thorax and abdomen blue; the anus furnished with three small projections. 5. A native of Europe; in walls.

Smooth, shining green; the thorax and superior part of the two first segments of the abdomen gilt; the anus furnished with four small projections. 6. A native of Europe; in walls of houses.

27 species of this genus have been described in the last edition of the System of Nature.

90. VESPA, *Wasp*.

Mouth composed of a horny substance. Jaw compressed. Feelers four, unequal, and filiform. Antennæ filiform; the first articulation longer than the rest, and cylindrical. Eyes large and circular. Body smooth. Sting pungent, and concealed within the abdomen. The upper wings are folded in the males, females, and neuters.

These live mostly in numerous societies, constructing curious nests or combs, generally under ground; they prey upon other insects, especially bees and flies, and devour meal, bread and fruit. The larva is soft, without feet, and feeds on the nectar of flowers and honey; the pupa quiescent, and has the rudiments of wings. Some of them are solitary, others live in swarms.

A. *No tongue.*

* *The Antennæ thicker towards their outer edge.*

* *crabro.* *Hornet.* The thorax black, marked on the fore part with reddish spots; there is a double dot contiguous to the divisions between the segments of the abdomen. 3. A native of Europe. It has its nest in hollow trees, in out-houses, or any dry situation; its combs are very neatly constructed, and composed of a substance like coarse paper, or decayed parchment. They prey on other insects, particularly on bees. Their sting is very painful.

* *vulgaris.* Thorax marked on each side with a small interrupted line; the scutellum marked with four spots; the divisions between the segments of the abdomen dotted with black. 4. A native of Europe, about houses; they prey on flies, and rob bee-hives. They live in swarms composed of males, females, and neuters. The male has a yellow head, and long antennæ; an abdomen composed of seven yellow segments, marked with black triangular spots. They are destitute of stings, but are longer and larger than the neuters, though smaller than the females. The female has short antennæ; lip yellow; abdomen composed of six segments, marked on the sides with two black dots, and is furnished with a sting. There are frequently between two and three hundred females, and as many males, in a swarm of wasps. A single female in the spring that had been impregnated in the preceding autumn, lays the foundation of a swarm. It makes itself a hole in some dry situation, or fixes on a mole hole, where it hastily builds a few cells, and deposits its eggs; which in the course of about twenty days, pass through their different changes, and become perfect insects. Almost the whole of those produced from the first deposited eggs are neuters. As soon as they are fit to fly about, they commence their labours, enlarge their hole by removing the earth with their mouth, go out in quest of materials for forming new cells, which are composed of small fibres of wood, cemented together by a glutinous substance formed within the body of the animal. They may frequently be seen on rails, posts, &c. on reeds, or stalks of decayed vegetables, gnawing off small particles which they convey to their nest, and deliver to those occupied in the construction of the work. The external covering of their nest is formed of several layers of thin leaves resembling

paper, which are not in immediate contact with one another, and in that way they prevent external moisture from penetrating into the cells, which are arranged in flat combs placed one over another, each story being supported by a number of very neat pillars. The female continues to deposit her eggs, which are oblong and yellowish, during the whole summer, to the amount of many thousands. A few hundreds of those that are last deposited, produce males and females, which are impregnated in the autumn, and which, should they survive the winter, lay the foundation of new swarms in the spring. All the neuters and males perish in the beginning of winter.

Body black; the thorax is marked with two dots; the scutellum is likewise marked with two dots, the abdomen with five yellow bands, the first of which is at a distance from the rest. 6. A native of Europe; about houses. It forms its nest in holes in wood.

Black; thorax marked with two pale yellow spots; the abdomen marked with four yellow bands, the first at a considerable distance from the rest. 8. A native of Europe, in walls; the scutellum without spots; the flanks of the legs yellowish.

First segment of the abdomen funnel-shaped; the second bell-shaped, and very large. 11. A native of Europe, in gardens. It attaches its nest, which is globular, and constructed of the same materials with that of the common wasp, to the branches of trees; the abdomen black, the segments yellow at the edges the first and second marked with two dots.

** *Antennæ filiform.* Crabrones.

The abdomen marked with two yellow bands; the anus furnished with three small projections; wings black, white at the edge. 98. A native of Europe. *tridentata.*

Thorax without spots; the abdomen marked on each side with five yellow spots; legs black. 101. A native of Europe, in sandy situations. Head large, terminating abruptly in the fore part; mouth of a silver colour; the spots on the abdomen uniting so as to form a band. *fossoria.*

B. *The Tongue bent inwards, and divided into three at the point.* Bombyces.

The upper lip conical and divided; the abdomen black, marked with waved yellowish bands. 152. A native of Europe, on sand hills. Their nests contain only a single larva. *rostrata.*

Black; lip roundish; the abdomen marked with six yellow bands, the first five of which are interrupted. 157. A native of Europe, covered with ash-coloured down; the thorax spotted with brown, the antennæ black, the first articulation yellow below, the last of a rusty colour; lip and legs yellow; the thighs black; the anus furnished with three small projections. *fasciata.*

The lip nearly conical; the thorax brown, spotted with yellow; abdomen black, marked with six yellow bands; antennæ and legs of a rusty colour. 159. A native of Europe; head brown; mouth yellow; the bands on the abdomen broad, the first four interrupted. *ruficornis.*

160 species of this genus have been described by Gmelin in the last edition of the System of Nature.

91. APIS, Bee.

Mouth formed of a substance resembling horn; the lip and jaw membranaceous at the tip; tongue bent inwards. Feelers four, unequal, and filiform. Wings plane. The females and neuters have a pungent sting concealed within the abdomen.

The insects of this genus live some of them in large societies, and some are solitary; their food is the nectar of flowers, honey, and ripe fruit; the larva is soft and without feet; the pupa resembles the perfect insect. The larvæ of the neuters are very numerous, and placed in hexagonal cells; the larvæ of the males are turgid and obtuse in the fore part, and tapering behind.

A. *The Tongue divided into five at the point; the Feelers very short.*

**centuncularis.* Black; the under part of the abdomen covered with yellow wool. 4. A native of Europe. It forms several nests under ground, very neatly composed of the leaves of roses. There are several species which form similar nests in the trunks of trees or in walls, composed sometimes of the leaves of the rose, at other times of those of the horse chestnut.

**punctata.* Black, covered with ash-coloured hairs; abdomen black; the segments of the abdomen marked on each side with a white dot; the scutellum entire. 59. A native of Britain, on flowers.

**mellifica.* *Common Honey Bee.* Downy; the thorax grayish; abdomen brown; thighs of the hind legs fringed with hairs; on the inside marked with transverse striæ. 22. A native of Europe, in hollow trees; but they are more frequently domesticated, and kept in hives. This well-known and busy insect lives in great swarms, composed of females or queens, males or drones, and neuters or working bees. The female is larger and longer than the rest, the abdomen being about one-third longer than the wings; the antennæ have ten articulations; the feet reddish. The males are larger than the neuters; their wings are longer than the body; their antennæ have eleven articulations; the trunk is covered with long hairs, and is of a tawny colour. The neuters as well as the females are gray on the thorax, and are furnished with a sting, of which the males are destitute; their antennæ have fifteen articulations; they are furnished with two stomachs. A swarm consists commonly of one female, from 1000 to 1500 males, and of nearly 20,000 neuters (vide BEE.) They construct regular combs, composed of hexagonal cells, with wax which is formed within the body of the insect. Reaumur and others have supposed, that the wax was formed from the farina of flowers, which the neuters collect and carry home on their legs, and their opinion has been implicitly followed. But Mr Huber, member of the Society of Natural Philosophy and Natural History of Geneva, by a set of very accurate experiments and observations, has clearly proven that the wax is formed from honey (vide *Journal de Physique, &c. Pluviose An, XII.*) We shall give here his own account of the experiments he has made. "It has been thought strange that the word wax should seldom occur in a book which treats of bees alone; but nevertheless, as in the course of my observations I had not attended to the products of

their industry, I could only have repeated what had been said by Swammerdam and Reaumur, and that did not seem to me to be necessary. I knew that these insects collected abundantly upon the antheræ of flowers; that they are acquainted with the method of opening them, of gathering their dust, keeping it in the cavities of their hind legs, and carrying it to their hives. It had been observed that the particles of this dust swell in water, and that when one of them bursts, an oily liquor runs out, which floats on its surface, but did not mix with it. From these experiments, repeated on the dust of a great number of flowers, it was concluded that they contain the principles of wax; but it was admitted that these must undergo a peculiar elaboration in the body of the bee, since, according to the experiments of Reaumur, a flexible wax could not be made from the dust of the antheræ. It will be seen here from several passages in my work that I had adopted this opinion; a single observation of Burnons, (the name of Mr Huber's secretary), changed all my ideas. The true origin of wax might have been sooner known, had there been any suspicion that it was not already discovered. I shall now state how I was led to doubt, and what I have done to verify my new conjectures.

"I was in Switzerland in 1793: the farmer of the estate on which I resided had many bees; and the greater part of his hives having been stocked in former years, the combs with which they were filled reached to the stands, consequently there was no room to construct new ones. We remarked, however, that the working bees carried in a considerable quantity of this fecundating powder. There was also in the same apiary, some swarms of that year, the hives having only been stocked a day or two; in some of them the combs were only begun; in others they were larger; but in all of them there were vacancies to fill up, and much work to do. We observed with astonishment, that the bees of these swarms did not carry in the pollen; and that, nevertheless, they worked with activity in the construction of new combs, and in lengthening those already commenced. Where, therefore, did they procure materials for their edifices? After these observations, we suspected that it was not from the dust of the stamina, and that they had a very different use for it than that for which it was believed to be intended. We, however, found that it was impossible to explain these extraordinary facts, without abandoning the hypothesis of Reaumur, by supposing that the bees of the old hives stored up so much pollen in their combs for their future wants, while those of the new swarms did not carry it outwardly on their legs, in the infancy of their establishment, because they had no cells in which they could deposit it; it might be sufficient to enable them to construct their combs, if they were at liberty to fly to the flowers, procure their pollen, and return to their hives after having filled their stomachs, where it must be elaborated, and converted into perfect wax. It was to obviate these doubts, that I undertook the following experiments.

"*First Experiment.*—On bees in confinement, with honey alone for their nourishment. Must pollen be ate by bees, to be in a state to produce wax? This was the first question which I thought it necessary to investigate; the method of trying the experiment was obvious;

it was only required to keep the bees within their hives, and thus prevent them from collecting or eating the fecundating powder. On the 24th of May, Burnons lodged a swarm in a straw-hive, with as much honey and water as was necessary for their consumption; and he closed the doors, so that the bees could not get out, and the air be at the same time renewed.

"At first the bees were very uneasy, but became calm on removing the hive to a cool dark place; their captivity lasted five days; they were permitted to come out into a room, the windows of which were shut; we then examined the hive more conveniently. We first noticed that there was no honey left in the vessel which had been filled with it, with the sole intention of feeding the confined bees; and were more astonished to see five combs of the most beautiful wax, suspended from the roof of the hive; they were perfectly white, and very brittle. This result was very remarkable; however, before forming a conclusion from it, that the honey with which these bees were fed, had enabled them to produce the wax, it was necessary to inquire, whether it could not also be explained in another manner. The bees which I had employed had doubtless collected the dust while they were at liberty. They might have done so the evening before, or on the very same day of their confinement, and might have enough in their stomachs, and in the cavities of their legs, to extract from it all the wax which we found in their hives. But if it was true that it had been obtained from the fecundating powder, previously obtained, this source was not inexhaustible, and the bees being unable to procure any more, they would soon cease to construct combs, and fall into the most complete inaction. It was necessary, therefore, to repeat the same trial, to render it decisive.

"The 28th, Burnons returned this swarm into its hive; after having taken out all the combs, he shut them up as before, with a fresh supply of honey. This experiment was not long, for on the evening of the second day we perceived the prisoners working with new wax. The next day the hive was inspected, and we found five combs, as heavy and as regular as those made during the first captivity. We afterwards repeated this experiment five times successively, with the same bees, and the same precautions: we always found that the honey had disappeared, and that new wax was produced. This result was so invariable during this long seclusion, that we could no longer doubt that the honey alone had supplied them with all the elements of their wax, without the assistance of the fecundating dust.

"*Second Experiment.*—On a hive from which honey was excluded, and in which only pollen and fruits, for the nourishment of the bees, were left, I thought it would not be useless to make the inverse of the preceding experiment; it would show me whether the pollen could not supply the want of honey, when the bees were deprived of it, and enable them to produce wax.

"I therefore enclosed a swarm in a bell-glass, in which had been placed a comb, whose cells contained only pollen, and the sole nourishment of the bees was fruit.

"These bees did not make combs, nor did they form a single cell during eight days, which was the time of their captivity. I was going to repeat this experiment, when Burnons remarked, that the free bees were, in some measure, in the same state as those we had con-

finer; there being no honey at that time in the flowers, they found only pollen, and did not work in wax.

"It may perhaps be asked, how I was satisfied of this: to which I answer, bees wax is white at first, the cells soon become yellow; and in time, this colour grows browner; and in older hives have acquired a blackish tinge. It is, therefore, very easy to distinguish the new cells from those which have been some time formed, and consequently to know whether the bees are really making combs, or whether that work is suspended; it is sufficient to raise the hives, and to notice the lower edge of the combs.

"The odour exhaled by the hives, and the shape of the bees, are indications, by which it may always be known whether there is honey in the flowers: if they are combined, there can be no further doubt; and, particularly, if a great number of bees return to the hive, which are remarkable for the bulk and form of their bellies. Those which are filled with honey, have the abdomen cylindrical; the name of wax-making bees, belongs to them exclusively: the bellies of the labouring bees, which have other functions, always preserve their ovoid form, and their volume is never sensibly augmented; the name of *nursing bees* is proper for these.

"The farmers of the neighbouring villages kept their bees in baskets, or in cases of different forms; and I was able to visit a very great number, without going to any great distance from my habitation.

"In 1793, an intemperate spring had retarded the separation of the swarms; there had not been any in the country before the 24th of May; and towards the middle of June there were several in the vicinity of my residence. At that time the fields were covered with flowers, the bees collected much honey, and the new swarms worked at the wax with vigour.

"On the 18th, Burnons visited 65 hives; at the entrance of all of them he observed wax-making bees. Those which returned to old hives, not having to construct cells, deposited their honey in the combs, or distributed it among their companions; those belonging to the young swarms converted their honey into wax, and hastened to construct combs for the reception of their young bees.

"It was showery on the 19th; the bees went abroad, but brought home only pollen. The weather was cold and rainy until the 27th. We were desirous of knowing if this had prevented their working. On the 28th, all the hives were lifted. Burnons found that the work had been stopped; the combs which he had measured on the 19th, were not at all increased, and were of a citron yellow; nor was there a single white cell in any of these hives.

"On the first of July, the chestnuts and limes were in blossom; the thermometer indicated the twentieth degree; the wax-making bees reappeared; they carried away great quantities of honey, which, as we had before observed, was employed in augmenting the provisions of the old hives, and enabling the young swarms to construct new combs. The greatest activity was observable among them; the gathering of honey, and the production of wax continued, until the middle of this month. July 16th, the heat remained the same; the field flowers, as well as those of the chestnut and limes, were completely withered; they yielded no more honey, their pollen alone attracted the working bees, and they collected

collected it abundantly; but there was not any wax produced; the combs were not lengthened; those of the young swarms did not fill more than two-thirds of their hives.

"August 9th. It had not rained for six weeks; the heat was very powerful, nor was there any dew to allay it during the night; the black wheat which had been in flower for some days, did not offer any honey to the bees; they found only pollen.

"On the 10th of August, it rained for several hours; next day, the black wheat had the odour of honey; in fact it might be seen glittering in their expanded flowers. The bees found enough to feed them, but too little to induce them to work at new wax.

"On the 14th, the drought recommenced, and lasted to the end of the month; no more honey appeared upon the flowers; and when we visited the 65 hives for the last time, we found, 1st, That the bees had not produced any wax after the middle of July. 2d. That they had stored up a great quantity of pollen. 3d, That the supply of honey was much lessened in the old hives, and that hardly any remained in the new swarms, that which they had collected in the spring having been employed in the preparation of wax. The pollen, therefore, has not this property, and no further doubt remained on this head. This year had not been stormy, and I have since ascertained, by a great number of observations, that electricity is singularly favourable to the secretion of honey by the flowers; the bees never collect it in greater abundance, nor is the preparation of wax ever more active, than when the wind is in the south, the air humid and warm, and a storm gathering.

"Heat too long continued, and the drought which is the consequence of it, cold rains, and principally a north wind, suspend it entirely.

"*Third Experiment.* On the use which the bees make of the fecundating powder. In the second experiment, the bees did not touch the pollen which I had placed within their reach, and as its quantity was not sensibly diminished during this trial, I was induced to believe it was not an aliment proper for them.

"I also knew that the new swarms were liable to perish from hunger in the middle of summer, and even when the country was covered with flowers, if a particular temperature, which is too uncommon in our climate, did not favour the secretion of honey in their nectaria. What, therefore, is the use of the pollen they collect with such avidity during eight months of the year, and of which they lay up such abundance (A)? This question remained to be investigated.

"I had a hive in divisions, the queen of which was barren; its combs did not contain any pollen, but they had much more honey; the two narrowest sides of this hive were formed of panes of glass, through which the surfaces of the exterior combs might be seen, and the conduct of the bees observed.

"I took away the queen on the 16th of July; but to console the working bees, I removed the first and

twelfth combs, in which there was not any thing to interest them; and I supplied their places with two combs, the cells of which were filled with eggs and worms of all ages. I carefully cut away all the cells in which pollen could be perceived, and shut up the hive with a grating. My intention will be guessed; I wished to know whether these insects could support their young without this fecundating powder. The next day nothing extraordinary occurred; the bees sat on their eggs and seemed to nurse them.

"On the 18th, after sunset, a great noise was heard in the hive. Anxious to see what occasioned it, we opened the shutters, and observed that all was in confusion; the incubation was stopped; the bees ran over the combs in disorder; we saw thousands precipitate themselves on the stand, those which were nearest to the mouth eagerly gnawing the grating; their intention was no longer doubtful, they wished to get out of their confinement.

"I was fearful of destroying them by continuing to prevent them from yielding to their instinct; they were therefore set at liberty. The whole swarm came out, but the hour was unfavourable to their collecting; the bees did not go far from the hive, the darkness and the chillness of the air soon compelled them to return, and probably calmed their agitation; for we saw them quietly reascend their combs, and order appeared, to us, to be re-established. This moment was taken to close the hive again. On the 19th, we saw two royal cells begun on one of the combs of the nursery: the evening of this day, and at the same hour as the day before, we heard a great tumult in the closed hive; it was in a general confusion, and we were again obliged to permit the swarm to come out. The 20th was the fifth day of their captivity. We thought it had been of sufficient duration, and were also very impatient to examine the nursery, and to see what was the cause of this periodical agitation of these bees: Burnons therefore opened the first and twelfth windows, and drove the bees from the combs, suffering them to take their flight in a room, the windows of which were shut. He first noticed that the royal cells had not been continued, that they did not contain any worm, and that there was not an atom of the jelly which serves for the nourishment and the cradle of the larvæ of the queens. He sought in vain for eggs, for worms, and for the liquid in the common cells; all had disappeared. Had these worms died of hunger? Had we, by withdrawing the fecundating powder, deprived the bees of every means of nourishing the larvæ.

To ascertain this, it would be sufficient to restore them their pollen, and observe the issue. The bees were, therefore, again returned to their prison, after having substituted young worms for those which had been suffered to die.

"On the 22d, we found that the bees had fastened these combs, and that they were again in a state of incubation; we then gave them some pieces of combs in which other bees had stored up the fecundating powder; and

(A) Reaumur was of opinion that the bees of a well-stocked hive, might collect at least a hundred pounds of this substance in the course of a year; but having remarked that the weight of wax, fabricated in the same time, did not exceed two pounds, he concluded that the bees extract only a very small portion of the true wax from this native wax, that the greatest part of it is required for their nourishment, and that the rest is discharged from their bodies in the form of excrement.

and the better to observe what they did with it, we took some of the pollen out of the cells, and laid it exposed on the stand of the hive. In a few minutes the bees discovered the pollen in the combs, and that which we had taken out; they took it grain by grain in their jaws, and conveyed it into their mouths; those which had eaten most voraciously reascended the combs, and placed themselves, at first, upon the cells of the young worms, which they entered head foremost, and remained there a greater or less length of time. One of the windows of the hive was now opened cautiously, Burnons powdered the bees which ate the pollen, and watched them for some hours; he observed that the marked bees always reascended the nursery, and immediately entered the cells of the young bees.

"The 23d, we found the royal cells begun.

"The 24th, we drove the bees from off the young worms; and we remarked,

"1st. That all of them had the jelly, as in the common hives.

"2d. That the worms had grown larger, and were forwarder in their cells.

"3d. That others had been shut up again: and,

"4th. That the royal cells had been lengthened,

"The 25th, we withdrew the pieces of comb which we had placed on the stand, and found that the quantity of pollen was certainly diminished; we afterwards replaced them in the hive with other cells filled with the fecundating powder.

"The 26th, the royal cells had been closed during the night, as well as several of the common ones.

"The 27th, I restored these bees to liberty. Burnons examined the cells with the greatest attention, and found jelly in all those which still contained worms, but most of them were shut with a lid of wax: he examined some of the latter, and found the worms employed in spinning cocoons of silk.

"All the worms therefore had been tended as in the natural hive. In this second trial we did not perceive any disorder in this hive; there had not been the least agitation: it is true some of the working bees attempted to go out in the course of the day; but finding it impossible, they reascended the combs quietly, which were never left for an instant. The hive being abundantly supplied with honey, and with the pollen necessary for their young, left them nothing to wish for; and they were still more happy when a queen was born, who afterwards became pregnant, and laid a great number of eggs. After these two experiments, there could be no more doubt that the fecundating powder was the aliment proper for the young bees, and that the want of this substance was the cause of their death, and of the evident anguish of their nurses during their first captivity.

"*Fourth Experiment.*—On bees deprived of honey and pollen, and which it was attempted to feed with fugar. I wished to know, if it was the saccharine part of the honey which enabled the bees to produce wax. Burnons confined a swarm in a glazed hive; one pound of Canary fugar was their sole aliment. He put a second swarm into another hive, and endeavoured to feed them with very coarse raw fugar; and to obtain a term of comparison, a third swarm was shut up in the same manner, and fed with honey. The bees of the three swarms produced wax; those fed with the different qualities of

fugar produced it sooner than the swarm which had only had honey, and they produced a greater quantity. A pound of Canary fugar reduced to syrup, and clarified with white of egg, yielded 10 gros, 52 grains, of a wax not so white as that which the bees extract from honey. An equal weight of raw fugar, gave 22 gros of very white wax. Maple fugar produced the same effect. This experiment having been repeated seven times successively, always employing the same bees, we could not doubt that fugar contains the principles of wax; and concluded that it was the saccharine part of the honey which had this property.

"*Conclusion.* These observations shew,

"1st. That the wax comes from the honey.

"2d. That the honey is also a food of the first necessity to the bees.

"3d. That flowers do not always contain honey, and that the secretion of honey depends in a great measure on the state of the atmosphere.

"4th. That it is the saccharine part of the honey which enables the bees to produce wax.

"5th. That raw fugar yields more wax than honey, or refined fugar.

"6th. That the dust of the stamina does not contain the principles of wax.

"7th. That this dust is not the food of the adult bees, and that they do not collect it for themselves.

"8th. That the pollen affords the only aliment which is proper for their young; but that this substance must undergo a peculiar elaboration in the stomachs of the bees, to be converted into an aliment; which is always appropriated to their sex, their age, and their wants; since the best microscopes do not shew the particles of pollen, or their coverings in the liquor, prepared by the working bees."

Hairy, black; wings of a violet-colour. 38. *A. violacea*. native of Europe, and of India. It pierces the trunks of decayed trees, or posts, and forms longitudinal excavations, in which it constructs several nests; having placed one at the bottom of the hole, it deposits an egg in it, fills it with a mixture of honey and pollen of flowers, closes it up, and commences another; it proceeds in this way till the cells occupy the whole length of the perforation; the eggs are so placed in the cells, that the head of the larva points downwards towards the exit.

Humble-bee. Hairy, black; thorax marked with a *terrestris*. yellow belt; anus white. 41. A native of Europe. It forms a nest at a considerable depth under ground, and collects a good quantity of honey.

Hairy, black; the anus of a tawny colour. 44. *A. na-lapidaria*. native of Europe; in heaps of stones, or in old walls. It collects a considerable quantity of honey.

Black; slightly covered with reddish hairs; abdomen *præcox*. smooth, marked with three bands, white above, and reddish beneath. 147. A native of Europe. It somewhat resembles *A. mellifica*, but less. It comes out very early in the spring.

B. *The Tongue divided into three at the extremity.*

* *The Lip furnished on each side with two membranaceous bristles.* Andrenæ.

Abdomen brown, marked with five whitish belts; the *bidentata*. anus furnished with two small projections. 136. A native of America. It forms its nests in walls, of leaves

of trees neatly folded up; the fore legs are long and yellow; the feet fringed.

dicbroa. Black; anus of a rusty colour. 137. A native of Europe; in groves.

** *Lip without bristles, compressed, and entire; posterior Feelers tongue-shaped.* Nomadae.

succica. Covered with ash-coloured hairs; the abdomen smooth and black; the second and third segments of the abdomen of a rusty colour. 200. A native of Europe; in groves.

variegata. The thorax and abdomen variegated with white; the legs of a rusty colour. 24. A native of Europe. It sleeps all night fixed to the flowers of the *geranium phœum*. The scutellum sometimes of a rusty colour, and sometimes white; the first and second segments of the abdomen marked with two white spots; the third, fourth, fifth, and sixth, marked with four.

morio. Very hairy, and black; the jaws broad, and marked on the outside with elevated lines, and rounded at the points; wings of a reddish violet-colour. 214. A native of the south of America. One of the largest of this genus.

92. FORMICA, Ant, or Emmet.

Feelers four, unequal, with cylindrical articulations, placed at the tip of the lip, which is cylindrical, and nearly membranaceous. Antennæ filiform. A small erect scale placed between the thorax and abdomen. The females and neuters have a sting concealed within the abdomen. The males and females have wings; the neuters none.

This is a gregarious, and proverbially industrious family, consisting, like bees, of males, females, and neuters. The last are the well known little insects, who construct the nests or ant-hills, who labour with such unremitting assiduity for the support of themselves and the idle males and females, and who guard with such ferocity the larvæ, or what are commonly called ant eggs. They wander about all day in search of food or materials for the nest, and assist each other in bringing home what is too cumbersome for such as have attempted it. They every day bring out of the nest, and expose to the warmth of the sun, the new hatched larvæ, and feed them till they are able to provide for themselves. In the evening they consume together whatever has been collected during the day, and do not, as is commonly supposed, lay up any store for the winter, but probably become torpid or die. They are peculiarly fond of *aphides*, and are themselves eagerly sought after by the ant-eaters, and various birds. The puncture inflicted by their sting, occasions a hot painful itching sensation. They contain a peculiar acid. See CHEMISTRY Index.

**herculeana*. Black; the abdomen oval; legs of a rusty colour. 1. A native of Europe, and America; lodge in the trunks of decayed trees.

viatica. Of a rusty colour; the abdomen oval and black. 23. A native of Europe; runs very quickly; the tip of the jaws black; the abdomen smooth.

**rufa*. Black; the thorax compressed; the legs of a rusty colour. 3. A native of Europe; it lodges in sandy hills, in woods; it is large, and has no sting.

Black; the mouth, the tip of the thorax, and legs, of a rusty colour. 4. A native of Europe; in woods.

Of a brick colour; eyes black; a black dot under the abdomen. 7. A native of Europe. It lodges under stones in woods. They inflict a very painful puncture.

Black; two knots on the filament which connects the abdomen to the trunk; the scutellum furnished with two small projections. 11. A native of Europe; in dry meadows, under moss. The males and females, in the month of August, leave their nest about mid-day, when the weather is serene, and fly about in the air. The abdomen oval.

The thorax marked with raised dots; the filament which joins the abdomen to the thorax is furnished with two knots; the body of a brick colour; the abdomen small. 12. A native of America. It is very destructive to all sorts of provisions. Small. The abdomen brown, covered with white hairs scarcely perceptible.

Black; abdomen oval and hairy. 50. A native of Europe; on decayed trees. It gnaws holes in the wood under the bark, and forms a number of passages for itself.

Black, smooth; the scale placed between the thorax and abdomen furnished with two small projections; the divisions between the segments of the abdomen whitish; legs reddish. 53. A native of Europe.

55 species of this genus have been described in the last edition of the System of Nature.

93. MUTELLA.

Mouth formed of a substance like horn; without a tongue. Jaw membranaceous at the tip. Lip projecting, resembling an inverted cone; at the extremity of which are placed four unequal feelers, with conical articulations. Antennæ filiform. Wings wanting in most species. Body downy. The posterior part of the thorax turned back. The sting is pungent, and concealed within the abdomen.

Scarlet; the abdomen marked with a black belt. 1. A native of Europe. The antennæ, eyes, legs, and under part of the body black; the sting long and filiform.

Black; the base of the abdomen marked with two yellow dots; the middle with an interrupted yellow streak; the extremity with a small white line. 10. A native of South America. Large; the lower part of the head marked with a white band; the thorax marked with two white lines, and with white on the inferior part.

Bluish; the abdomen marked with a large golden-coloured spot. 13. A native of New Holland.

Black; the thorax reddish; the edges of the segments of the abdomen white. 4. A native of Europe; in woods of maple.

Hairy, black; the thorax reddish; the abdomen marked with two white dots, and with a white band on the posterior part. 15. A native of Europe; the upper part of the shanks brown.

27 species of this genus have been described in the last edition of the System of Nature, published by Gmelin.

VI. DIPTERA.

WINGS two. Poifers clavated; one placed behind each wing, under a little scale.

94. OESTRUS. *Gad-fly, Breeze.*

A sucker drawn back within the lips, which are connected, and furnished with a small pore. Feelers two, of two articulations, orbicular at the tip, and seated in a depression on each side of the mouth. Antennæ short and setaceous.

The face of this singular genus is broad and depressed, and has some resemblance to the ape. They are extremely troublesome to horses, sheep, and cattle, depositing their eggs in different parts of their bodies, and occasioning painful tumours and even death. The larva is without feet, thick, short, soft, and composed of several segments; they are sometimes furnished with hooks. They lurk within the bodies, or under the skin, of horses, oxen, &c.; and feed on their juices during the winter. The pupa is without feet, oval, and incapable of motion, covered with a hard light-brown crust. The perfect insect lives but for a short time.

**bovis.*

Wings brown, without spots; the abdomen black, white at the base, and of a tawny colour at the extremity. 1. A native of Europe. It deposits its eggs on the backs of oxen, and lodges them under the skin. The larva, when young, is smooth, white, and transparent; as it advances in age it becomes brownish, and when full grown and ready to be changed into a pupa, it acquires a dark-brown colour. It is lodged in a sack formed in the cellular substance immediately under the skin, and occasions a very considerable tumour on the back of the animal. The sack communicates with the air by a very narrow opening, next to which the anus of the animal is placed. Through the anus a yellow purulent matter is discharged; and near the anus are situated two spiracula. There is a small indentation on the opposite extremity of the larva, which is situated at the bottom of the sack, surrounded by two or three papillæ, which forms the mouth. It has a number of dots on its surface, disposed in transverse interrupted lines. Two distinct and different kinds of lines are seen on each segment; the uppermost of them is narrower, and consists of larger dots. Underneath this is a broader line, and the dots considerably smaller. The first are easily seen, by using the lens, to be hooks bent upwards, or towards the tail of the insect. On examining the broader line of small dots, with a tolerably powerful magnifier, they are also found to be hooks, but turned in an opposite direction, that is, downwards in the sack, and towards the head of the insect. These hooks, it is probable, are occasionally erected by the muscles of the skin; and according to the series of them used by the larva, it is raised or depressed in the sack; and by this motion, and consequent irritation, a more or less copious secretion of pus is occasioned for its sustenance.

This singular arrangement of hooks round the body of the larvæ, in this instance serves the same purpose as the legs in other larvæ, enabling them to move about in

the sack, and to crawl out of it when about to change into pupæ.

They never change their skin like most other larvæ, the same serving them through their growth; and it at length also serves to form the shell of the pupa. After leaving the sack, and previous to their becoming pupæ, they contract themselves, and assume a different figure.

They continue in the state of pupæ from about the latter end of June until about the middle of August, when the fly appears. Full grown larvæ are sometimes to be met with on the backs of cows in the month of September, which probably remain in the state of pupæ till the ensuing spring. The perfect insect, on leaving the hard crust which surrounds it, forces open a very remarkable, marginated, triangular valve, which may be traced in the skin of the larvæ, and is situated on one side of the smaller end.

The *ostrus bovis*, in its perfect state, is the largest of the European species of this genus, and is very beautiful.

The pain it inflicts in depositing its eggs is much more severe than any of the other species. When one of the cattle is attacked by this fly, it is easily known by the extreme terror and agitation of the whole herd; the unfortunate object of attack runs bellowing from among them to some distant part of the field, or the nearest water, while the tail, from the severity of the pain, is held, with a tremulous motion, straight from the body, in the direction of the spine; and the head and neck are also stretched out to the utmost. The rest, from fear, generally follow to the water, or disperse to different parts of the field. When the oxen are yoked to the plough, the attack of this fly is attended with real danger, as they become perfectly uncontrollable, and will often run with the plough directly forwards, through the hedges, or whatever obstructs their way. There is provided, on this account, a contrivance in many ploughs, to set them immediately at liberty.

The strongest and healthiest beasts seem constantly to be preferred by it, and commonly have the greatest number of botts, wormuls, or warbles, on their backs; dealers are frequently guided in their choice of cattle by this circumstance. The female fly is very quick in performing the operation of depositing her eggs: she does not appear to remain on the back of the animal more than a few seconds.

Gray, marked with a white band, and dotted with *buccatus* black. 6. A native of Carolina.

Black, hairy; wings of a footy colour; their outer *trompe* edge bright black; head, thorax, scutellum, and anus, grayish yellow. 7. A native of Lapland. The larvæ occupy the frontal sinus of the rein-deer; the animal sometimes in the spring, forces out great clusters of larvæ by sneezing. This is the largest species of the genus.

Wings without spots; the thorax yellow, marked *tarandi* with a black band; the abdomen tawny, and bright yellow at the extremity. 2. A native of Lapland. It deposits its eggs on the back of the rein-deer. Such is their dread of it, that they every year leave the woods, and take refuge in the mountains. A very great proportion of them fall victims to this insect, before they are three years old. Those who escape with life are very much emaciated, and have their skins spoiled.

Botts.

* *equi*.

Botts. Wings whitish, marked with a black band in the middle, and two black dots. A native of Europe. (*Vide* Transactions of the Linnæan Society, vol. iii. p. 326.) The forehead white and downy; top of the head brown; the eyes black, and distant from one another; thorax brown, with a dark-coloured centre; the abdomen yellowish brown, the divisions between the segments of the abdomen marked with black spots and dots; the scutellum furnished with two tufts of hair; wings marked near the base with a very small black dot, in the middle with a black band, and towards the extremity with two black spots. The male is distinguished by a brighter yellow; the female by a deeper brown, and by the extremity of the abdomen which is long, bent inwards, and black, terminating in a bifid style. It deposits its eggs on the hairs of the knees or sides of horses, which, when the animal licks itself, are conveyed by the tongue into the stomach. The body of the larva is composed of eleven segments, all of which, except the two last, are surrounded with a double row of horny bristles directed towards the truncated end, and are of a reddish colour except the points, which are black. These larvæ attach themselves to every part of the stomach, but are generally most numerous about the *pylorus*; and are sometimes, though much less frequently, found in the intestines. Their numbers in the stomach are very various, often not more than half a dozen; at other times more than a hundred; and if some accounts might be relied on, even a much greater number than this. They hang most commonly in clusters, being fixed by the small end to the inner membrane of the stomach, to which they adhere by means of two small hooks or *tentacula*. When they are removed from the stomach they will attach themselves to any loose membrane, and even to the skin of the hand. For this purpose they sheath or draw back the hooks almost entirely within the skin, till the two points come close to each other; they then present them to the membrane; and keeping them parallel till it is pierced through, they expand them in a lateral direction, and afterwards, by bringing the points downwards towards themselves, they include a sufficient piece of the membrane, and remain firmly fixed for any length of time. These hooks, the better to adapt them to this purpose, appear to have a joint near their base.

The larvæ attain their full growth about the latter end of May, when they quit their hold of the internal membrane of the stomach, and pass along with the food through the intestinal canal. From the end of May till the beginning of July they may be seen in the dung which drops from the horse; when they reach the ground they seek out some convenient situation, and become pupæ, and remain in that state for about six or seven weeks. The mode pursued by the perfect insect to obtain for its young a situation in the stomach of the horse, is truly singular, and is effected in the following manner.—When the female has been impregnated, and the eggs are sufficiently matured, she seeks among the horses a subject for her purpose; approaching it on the wing, she holds her body nearly upright in the air, and her tail, which is lengthened for the purpose, curved inwards and upwards: in this way she approaches the part where she designs to deposit the egg; and suspending herself for a few seconds before it,

suddenly darts upon it, and leaves the egg adhering to the hair; she hardly appears to settle, but merely touches the hair with the egg held out on the projected point of the abdomen. The egg is made to adhere by means of a glutinous liquor secreted with it. She then leaves the horse at a small distance, and prepares a second egg, and poising herself before the part, deposits it in the same way. The liquor dries, and the egg becomes firmly glued to the hair: this is repeated by various flies till 400 or 500 eggs are placed sometimes on one horse.

The inside of the knee, or those parts of the body of the animal that are liable to be licked, are chosen by the fly from instinct, as the proper places for depositing its eggs. The well-known disease in horses called the *botts*, which frequently proves fatal, is supposed to be occasioned by the larvæ of this insect.

Wings without spots; the thorax of a rusty colour; *nasalis*. abdomen black, covered with yellow hairs. 3. A native of Europe. This insect is said to deposit its eggs in the nostrils of horses, mules, asses, and of goats; and the larvæ occupy the fauces. Body black; thorax destitute of furrows; the head and abdomen covered with yellow hairs, except the first segment, which is covered with white ones.

Thorax yellow, marked with a black band; wings *hæmorrhoidalis*. white, marked with black bands. 4. A native of Europe. It deposits its eggs on the lips of horses, occasioning a titillation, which causes the animal, when attacked by it, to move his head about violently, and gallop about with every appearance of distress. The larva of this insect needs not to be particularly described, as it resembles in almost every respect that of the *equi*. Its habits are the same, being seen in the stomach of the horses, occupying the same situation as those of the *equi*, from which they can only be distinguished by their smaller size and greater whiteness. When it approaches maturity it acquires a red colour. It is frequently seen adhering to the extremity of the rectum; which circumstance, along with its colour, has occasioned it to receive the name of *hæmorrhoidalis*. In about two days after it has left the body of the horse, it is changed into a pupa, in which state it remains nearly two months.

Wings faintly dotted; the abdomen variegated with white and black. 5. A native of Europe. The larva occupies the frontal sinus of the sheep; they are flat on the one side, and convex on the other; of a whitish colour; and nearly of the same size with the larvæ of the *O. equi*. When young these larvæ are perfectly white and transparent, except the two horny plates, which are black. As they increase in size, the upper side becomes marked with two transverse brown lines on each segment, and some spots are seen on the sides. When full grown they fall through the nostrils, and change to the pupa state, lying on the earth. The insect deposits its eggs on the inner margin of the nostrils of the sheep. The moment the fly touches that part of the sheep, they shake their heads, and strike the ground violently with their fore feet; at the same time holding their noses close to the earth, they run away, looking about them, on every side, to see if the fly pursue. They do not, like the horses and cows, take refuge in the water; they have recourse to a rut, or dusty road, or a gravel pit, where they crowd together during the

heat of the day, with their noses held close to the ground, which renders it difficult for the fly conveniently to get at the nostril.

antilopæ. Wings dotted with brown, and marked with a brown band; body hairy, of a grayish yellow colour; the abdomen marked with three rows of blackish spots. 8. A native of Asia. It deposits its eggs under the skin of the back of the antelope. About the size of the *musca carnaria*.

fasciulus. Yellow and downy; the anus furnished with three tufts of black hairs. 9. A native of Siberia; head and eyes black.

bomiris. Entirely brown. 10. A native of South America. Deposits its eggs under the skin of the abdomen of the natives, or of people residing in countries where they are prevalent. The larvæ continue six months under the skin; if they be disturbed, they penetrate deeper, and produce very troublesome ulcers, which sometimes prove fatal.

10 species of this genus have been described in the last edition of the System of Nature.

95. TIPULA, Crane-fly.

Mouth furnished with a very short proboscis, membranaceous, and grooved on the back, receiving a bristle; with a short sucker without a sheath; and with feelers two, equal, filiform, and longer than the head. Antennæ in most of the species filiform.

Most of this genus have a great resemblance to the gnat. They feed on various substances. The larva is soft, without feet, and cylindrical; its head is furnished with a small projection, and terminates abruptly; they feed on the roots of plants; they are eagerly sought after by crows and other birds. The pupa is cylindrical, and is furnished with two horns on the anterior extremity, with small projections behind.

A. Wings expanded.

** pectinicornis.* The antennæ pectinated; the wings marked with a black spot; the thorax yellowish. 1. A native of Europe; in moist places. The abdomen reddish at the base, marked with a yellow band in the middle, black at the tip.

oleracea. Wings transparent, with a brown rib along the edge. 5. A native of Europe. It does a great deal of mischief in gardens, corn fields, and meadows, by consuming the roots of potherbs, growing corn, and grass.

** hortorum.* Wings transparent, sprinkled with very faint spots. 6. A native of Europe; in gardens, destroying the crops.

** triangulalis.* One half of the wings brown, marked with white triangular spots. 111. A native of Scotland.

** variegata.* Black; the base and sides of the abdomen red, spotted with yellow. 7. A native of Europe; in gardens.

** pratensis.* The thorax variegated; abdomen brown, spotted with yellow on the sides; the forehead tawny. 10. A native of Europe; in meadows. It is very destructive to the roots of grass.

cornicina. Wings transparent, marked on the edge with a brown spot; the abdomen yellow, marked with three brown lines. 12. A native of Europe. Very destructive to the roots of plants, and much sought after by crows.

Wings transparent, and shining; body of a brownish ash colour. 21. A native of Europe. This species appears very early in the spring; and may be seen dancing in the air in great numbers in mild weather.

B. Wings incumbent. Culiciformes.

Thorax greenish; wings white, marked with a brown dot; the antennæ feathered. 26. A native of Europe; in marshy places.

Greenish; wings spotted; the fore legs very long. 27. A native of Europe; on the sea coast.

Black, smooth; wings white, marked with a black dot; the antennæ short; legs black. 41. A native of Europe; in shaded places.

Black; smooth, wings transparent, marked with a black dot; the thighs of a rusty colour. 101. A native of Britain, and Norway; on the flowers of fruit trees.

Black, silky. 45. A native of Europe; on the flowers of fruit trees, which it injures very much. It frequently blasts the hopes of the farmer.

Wings transparent; the outer edge black. 46. A native of Europe. It is very destructive to asparagus, and to the flowers of fruit trees. The thorax and abdomen sometimes black, sometimes red.

Wings of an ash colour; the thorax and abdomen yellow. 123. A native of Chili. This insect has a very pleasant smell, and is made use of by the young girls of Chili for perfuming their clothes.

Of a tawny colour, wings white and transparent, hairy on the margins; the eyes black. A native of England. Larva leaps; without feet; is orange-coloured, and marginated; the margin folded with papillæ; the head acute; the tail terminating abruptly. The pupa is narrow, acute at both ends and reddish.

126 species of this genus have been described in the last edition of the System of Nature.

96. DIOPSIS.

The head furnished with two filiform horns, without articulations, much longer than the head, on the tops of which the eyes are placed.

1. A native of North America and Guinea. Reddish; antennæ very small and fetaceous; the horns of a rusty colour; the eyes which terminate the horns are globular and black; the thorax black; furnished with two yellow tapering projections behind, and with a single one on each side; wings transparent, and marked with a black dot before; the abdomen clavated, and attached to the trunk by a narrow stalk; the two last segments of the abdomen black; the legs yellow; the thighs of the legs clavated. It resembles an *ichneumon*, and is about the size of the red ant.

Only one species of this genus has been described in the last edition of the System of Nature.

97. MUSCA, Fly.

Mouth furnished with a fleshy projecting proboscis, with two equal lips, with a sucker furnished with bristles, and with two short feelers. Antennæ short (in most species).

Flies live chiefly in dunghills; their larvæ are without feet.

feet, composed of several segments, nearly cylindrical, and becoming smaller behind. The larvæ of the flies of the first and second divisions, live in the water, have a breathing hole at their head, are bearded, and live on aquatic animalculæ; those of the fourth division live on rubbish; those of the third on dung, putrid animal substances, and on small insects; some of them particularly on *aphides*: they remain fixed on a leaf, and with their snout collect, and devour the *aphides*. The pupæ are immoveable, and most of them covered with a hard skin; the pupæ of the flies of the first and second divisions are cylindrical, and covered with the skin of the larvæ, which becomes hard.

A. *The Sucker composed of a single valve; the Antennæ connected at the base, and sharp at the points.* Bibiones.

* *plebeja*. Of an ash colour, and hairy; the abdomen conical; the edges of the segments white. 1. A native of the north of Europe. The thorax is sometimes yellow, and abdomen of a rusty colour.

* *marginata*. Black; the abdomen conical; the edges of the segments white; the wings spotted. 130. A native of Europe.

B. *Sucker without a sheath.*

a. *Those which have a single bristle.*

† *The Antennæ pointed and connected at the base.* Stratiomyes.

* *chamaeleon*. The scutellum pale yellow, and furnished with two small projections; the abdomen black, marked on the sides with yellow bands. 3. A native of Europe; on flowers. The larva lives in fresh water.

* *uliginosa*. Body black; the scutellum without projections; the abdomen white, and black at the extremity. 22. A native of Europe. The forehead yellow; the joints of the legs white; the flanks of the legs pale.

* *vallata*. The scutellum marked with six projections; the abdomen and thighs yellow. 166. A native of Britain; on hedges. Wings of a faint rusty colour; incumbent and plain; the nerves of the wings marked with a brown dot in the middle; the poisers yellow; the feet, and lower extremity of the flanks of the legs brown.

* *nectarea*. Black; antennæ cylindrical and perfoliated; wings white. 24. A native of Europe; on the flowers of apple trees. It drinks the nectarious juice, and lodges all day long within the flower; it is very small, and not larger than a common flea; body oblong; legs long.

††. *The Antennæ short and clavated, furnished with a bristle.*

* *Feathery, or with hairy feathered Antennæ.*

* *inanis*. Brown; the abdomen transparent, marked with three black belts, 61. A native of Europe; in thickets.

* *pellucens*. Black; the first segment of the abdomen white, and transparent. 62. A native of Europe; in shaded places.

* *cafar*. Shining green; legs black. 64. A native of Europe; on carrion.

* *cornicina*. Thorax of a shining copper colour; the abdomen of a greenish yellow with a metallic lustre; legs black.

169. A native of Europe. The sides of the lips of a shining silver colour.

Shining; the thorax blue; the abdomen green. 65. * *cadaverina*. A native of Europe; on carrion.

The thorax black; the abdomen shining blue; the forehead tawny. 67. A native of Europe and America; on carrion; they consume dead bodies very quickly; they likewise feed on milk.

Black; the thorax marked with pale lines; the abdomen shining, and chequered. 68. A native of Europe; on carrion. The eyes reddish; the anus tawny. The larva likewise infests bee-hives.

Common house-fly. The thorax marked with lines; the abdomen chequered, and pale on the under side at the base. 69. A native of Europe and America; in houses. The larvæ live in horse dung.

Brown; the thorax blue and downy, marked with three eminences; the tip of the scutellum and thighs yellow. 390. A native of Europe; very destructive to olives. The female deposits a great number of eggs in the month of July, on the fruit of the olive; the larvæ consume the pulp.

** *The Antennæ furnished with a naked bristle.*

Smooth, black; the abdomen wrinkled on the upper side, marked with white streaks; wings brown. 14. A native of Europe: in windows.

Blackish; the tip of the scutellum of a faint brick colour; the abdomen chequered. 78. A native of Europe; on the caterpillars of moths and butterflies, and likewise on the roots of cabbage and colewort, rendering the root knotty; the tips and base whitish; thorax black, marked with lines.

Black; the abdomen of an ash colour, marked with black bands. 79. A native of Europe; on the roots of the raddish.

Hairy and whitish, marked with a black line on the back, and with several black lines along the sides. 208. A native of Europe; on the roots of the turnip, which it destroys, and causes to appear as if rotten; it attacks those turnips chiefly that have been sown in light sandy soil. The larva is white, without feet; the head is pointed and tipped with black; it undergoes its transformation about September. Pupa is oblong, brown, composed of several segments, and becomes a perfect insect in May.

Of an ash colour; the thorax marked with five black spots, the abdomen marked with very faint spots. 83. A native of Europe. It is to be seen flying about in swarms before rain.

Hairy and ash-coloured; the extremity of the thighs and flanks of the legs of a rusty colour. 212. A native of Britain; and feeds on other flies.

Black; the abdomen pale; the eyes of a rusty colour. 87. A native of Europe; in cellars.

Black; the abdomen of an ash colour; the wings yellowish at the base. 88. A native of Europe. They fly about very much in the air immediately before rain, and collect about the mouths of horses in great swarms, particularly about the summer solstice. The larvæ are sometimes found in the human stomach.

Shining black; eyes brownish; wings shining red and green. 216. A native of Europe; in oats, which it

destroys by gnawing the stalks when young. Larva yellowish and without feet.

* *frit.*

Black; the poisers and feet of the hind legs, and abdomen, pale green. 90. A native of Europe; on the ears of barley. It is so frequent in Sweden, that it has been calculated that one tenth of the grain is consumed by it annually.

* *pumilio-nis.*

Black; the under part of the head, and two lines on the thorax yellow; the poisers white; the legs of an ash colour and black at the tip. 217. A native of Europe. The larva has a sharp head, black at the extremity; the body white, composed of ten segments; it is changed into a pupa about the end of May. The pupa is yellow, shining, and composed of several segments; the perfect insect appears about the middle of June. At what time it deposits its eggs is not well ascertained. The larvæ are perceived early in the spring, in the centre of the stalks of wheat and rye, very near the root. In all probability the eggs have been deposited in the month of October, or end of September, as the early sown grain is found to be most affected. White wheat is more liable to be injured than red. The stalks in which the larva is lodged, do not advance in growth, but continue dwarf, whence the insect has received the name of *pumilionis*. The stalks become yellow in the beginning of summer, and decay; others commonly spring up from the same root, and supply their place. This insect first attracted notice in England in the spring of the year 1791, when it excited some alarm, as fears were at first entertained that it was the Hessian fly, which had done so much mischief in America. Some plants of infected wheat were sent to Mr Markwick by a friend in the neighbourhood of Battle. Mr Markwick succeeded in obtaining the perfect insect from them, of which he has given an account, (*Vide Transactions of the Linnean Society, p. 76. tab. 15.*) Some of the infected wheat was likewise sent by Arthur Young to Sir Joseph Banks, who ascertained the insect to be the *musca pumilionis* described in Gmelin's System of Nature, and not the Hessian fly. An account of this fly, and of the mischief caused by it, was first published in the Transactions of the Royal Academy of Sciences at Stockholm for the year 1778, by Mr Ob. Bjerkan-der, who discovered it on the young shoots of the rye, in the month of May; and in such quantity, that in some fields he found three or four stalks affected in a square foot.

petronella.

Livid; the forehead red; the legs long, and of a light red colour; the joints of the legs black. 96. A native of Europe. It may be seen running about on the surface of stagnant water.

jonchi.

Wings transparent, marked on the edge with a black spot; the eyes green. 121. A native of Europe; on the receptacles of the flower of the sow-thistle. Thorax brown, with a pale scutellum; the abdomen black, oval, and greenish beneath; the edges of the segments whitish; tail with an obtuse style; wings with two brown nerves; legs of a brick colour.

b. *Sucker furnished with three bristles.* Ragiones.

vermilio.

Of an ash colour; the abdomen marked with three rows of black dots; the thorax spotted; the wings without spots. 17. A native of Europe; in loose sand.

Black; the divisions between the segments of the *colomba-* abdomen, the shanks of the legs, and feet, white. 324. *schensise*.

A native of Europe and Asia. It is about half the size of the common gnat, and is most frequent in the beginning of spring and end of summer, in Servia, Russia, and Siberia; where it insinuates itself into the bodies of cattle, which it frequently destroys, as its bite proves fatal in a few hours; smoke is very offensive to it; and in the places where it prevails the people have recourse to it, as their only mode of defence.

Antennæ, body, and wings hairy. 325. A native *papatasi* of Europe. It is very troublesome in Lombardy in the night time, during the whole summer. It is very minute; eyes black, dotted with white; the wings when the insect is at rest, diverge so as to form an obtuse angle; the abdomen red.

Black; the abdomen long, slender, and tapering to *acuminata*, towards the extremity; the wings spotted; the thighs reddish-yellow; the shanks of the legs and feet brownish. 226. A native of Europe.

c. *The Sucker furnished with four bristles.* Syrphi.

|| *Bristle of the Antennæ feathery.*

Black; the abdomen hairy, and reddish behind. 25. * *bombylans.*

A native of Europe; among bushes. The anterior part of the thorax yellow; the extremity of the abdomen white; the wings of a rusty colour at the tip. 328. A native of Europe; the posterior part of the thorax, the forehead, and abdomen black; wings obscure.

||| *The Bristle of the Antennæ simple and smooth.*

Black, without hairs, the sides of the thorax marked *conopsea* with yellow lines, the abdomen with three yellow lines. 21. A native of Europe; among bushes.

The thorax marked with four yellow lines; the abdomen with three interrupted yellow bands. 28. A native of Europe. The larva lives in stagnant water, and is suspended by a long filiform tube through which it breathes.

Thorax gray; the abdomen brown; the thighs of *tenax*, the hind legs compressed. 32. A native of Europe; in dunghills, in necessaries, and in putrid water. The larva is very tenacious, and difficultly destroyed by pressure.

Very slightly hairy, black; the thorax without spots; the abdomen marked with six white circular spots. 51. A native of Europe; and feeds on the *aphides* on the leaves of the pear tree.

Black; not hairy; the thorax spotted; the abdomen marked with four yellow belts, the scutellum yellow, *tri*. 54. A native of Europe; on flowers, chiefly on the mint. The perfect insect feeds on honey, the larva on aphides.

Naked; yellow; the upper part of the abdomen *saltatrix* brown; the thorax marked with three brown lines. 60. A native of Europe; in meadows, where it leaps about on the ground like a grasshopper; the longitudinal line on the thorax, somewhat broad, marked with an oblong black spot, and with a black line on each side towards its extremity; poisers white.

360 species of this genus have been described in the last edition of the System of Nature, published by Gmelin.

98. TABANUS, *Ox-Fly*.

Mouth furnished with a straight, projecting, and membranaceous proboscis; with a small and oval head; with two equal lips; with a long projecting sucker, which can be concealed in a groove on the back of the proboscis. Sheath of one valve, and furnished with five bristles. Feelers two, equal, clavated, and sharp at the points. Antennæ short, cylindrical, approaching to one another, pointed, and composed of seven articulations.

These insects live by sucking out the blood of various animals, of which they are very greedy. The larvae are found under ground, in moist meadows: the colour of the eyes vanishes when the insect is dead, but may be restored by placing it in warm water.

* *bovinus*. Eyes greenish; the back of the abdomen marked with long triangular white spots. 4. A native of Europe. It is very troublesome to horses, and horned cattle; their bite is painful; they even molest the human species in very warm weather; they are most frequent in moist situations.

tarandinus Eyes green; the segments of the abdomen yellow on the edges; legs reddish. 7. A native of Europe. They wound the tender horns of the rein-deer, and spoil their shape; they are met with in Italy, and the southern parts of Europe, as well as in Lapland.

pellucens. Black; eyes marked with bands; first segment of the abdomen bluish; the shanks of the legs pale.

* *paganus*. The anterior parts of the eyes green, marked with three tawny bands; the abdomen marked on both sides with rusty-coloured spots. 25. A native of Britain.

* *tropicus*. Eyes marked with three purple bands; the sides of the abdomen of a rusty colour. 14. A native of Europe; very troublesome to cattle, especially to horses, immediately before rain.

* *pluvialis* Eyes green, marked with four waved bands; wings dotted with brown. 16. A native of Europe.—This little animal fixes on the hands, face, and legs, and excites a painful inflammation in the part where it has drawn blood.

* *cacutiens*. Eyes green, dotted with black; wings without spots. 17. A native of Europe. It is extremely troublesome in hot weather, especially before rain, fixing on the hands and face, or any uncovered part; it draws blood very dexterously, and leaves an inflamed bloody puncture behind.

38 species of this genus have been described in the last edition of the System of Nature published by Gmelin.

99. CULEX, *Gnat*.

Mouth furnished with a sheath of one piece, flexible, and set with five bristles. Feelers two, composed of three articulations. Antennæ filiform.

The insects of this genus live on the juices of the larger animals, and are eagerly sought after by poultry,

and small birds. The larva lives in stagnant waters, and has a small cylindrical respiratory tube, near the tail; the head is armed with hooks to seize on the aquatic insects upon which it feeds; it is devoured by ducks, and water fowl. The pupa is curved and oval, with respiratory tubes near the head. They continue but a short time in the state of larva and pupa. The perfect insect deposits her eggs in clusters on the surface of the water, where they remain for a few days until they are hatched. Gnats in this country, however troublesome they may be, do not make us feel them so severely, as the musquito does in foreign parts.

Of an ash colour; the abdomen marked with eight * *pipiens*. brown rings. 1. A native of Europe, and the northern parts of Asia and America; in the neighbourhood of fresh waters, and in marshy places. It is larger in more southerly climates, and its bite occasions more pain and inflammation. When on the wing it makes a constant shrill noise, whence it has received its name *pipiens*. The male is not easily distinguished from the female by its pectinate antennæ: it is more troublesome, and its bite more painful than that of the female. Ducks, and other aquatic fowls, feed their young with them; different species of the *libellula* likewise devour them. They sometimes insinuate themselves into the lungs and intestines of quadrupeds, where their bite excites a fatal inflammation. The natives of countries where they are very troublesome, have recourse to the smoke of different vegetables as a defence. In warm climates they are frequently compelled to make use of gauze curtains, which they draw close round them when asleep. They are said to shine in the dark.

Brown; the abdomen and feet marked with white *annulatus*. rings; the wings spotted. 8. A native of the north of Europe; the snout half the length of the body.

Brown; the thorax faintly marked with lines. 3. * *bifurcatus*. A native of Europe; in marshy situations.

Brown; wings white, marked with three obscure * *pulicaris* spots. 10. A native of Europe; it creeps about a great deal; its bite is succeeded by a brown spot.

13 species of this genus have been described by Gmelin, in the last edition of the System of Nature.

100. EMPIS.

Sucker with a sheath of one piece, furnished with three bristles, and an insected proboscis. Feelers short, and filiform. Antennæ setaceous.

The minute insects which compose this genus, live by sucking out the blood and juices of other animals.

Black; wings nearly round, and of a rusty colour. * *borealis*. 1. A native of Europe; they may be seen dancing in the air in great numbers in the evening when the weather is good.

Black; the hinds legs long and feathered. 2. A * *pennipes*. native of Europe; it is frequently found on the leaves of the *geranium sylvaticum*, and *cardamine pratensis*.

Livid; thorax marked with lines, the base of the * *livida*. wings and legs of a rusty colour. 3. A native of Europe; it is frequently to be found on the *heraclium spondylium*; the upper part of the abdomen very dark brown; wings oblong, marked with brown veins.

Of

* *cinerea*. Of an ash colour; thorax without spots; legs pale; wings brown at the tip. 9. A native of Europe; on umbelliferous plants.

19 species of this genus are described in the edition of the System of Nature published by Gmelin.

101. STOMOXYS.

Sucker consisting of a sheath of one piece, and furnished with enclosing bristles. Feelers two, short, bristle-shaped, and composed of three articulations. Antennæ setaceous.

The insects of this genus live by sucking the blood and juices of other animals; those of the division *ringiæ* principally attack insects of the orders *lepidoptera* and *diptera*.

A. *The Sheath convoluted, and bent at the base, with an angular flexure, and furnished with two bristles.*

* *calci-trans*. Gray; antennæ slightly feathered; legs black. 4. A native of Europe. It resembles the common fly very much in every respect, except in the snout, and in having the segments of the abdomen marked with two black spots. It is very troublesome to horned cattle; by getting about their feet, it causes them to kick, and stamp with their feet: before rain it bites more frequently. It does not spare the human species, particularly in autumn.

* *irritans*. Of an ash colour, and somewhat hairy; the abdomen spotted with black. 5. A native of Europe. This species is very frequent, and troublesome to cattle; by fixing on their backs, it causes them to keep their tails almost in constant motion to lash it off.

* *pungens*. Of an ash colour, with black thighs. 6. A native of Europe. It is very troublesome to cattle, resembles *St. irritans*, but much smaller wings; whitish, without spots; the abdomen sometimes of a dark colour.

B. *Sheath covering the mouth, and furnished with four bristles.* Rhingiæ.

* *rostrata*. Thorax faintly marked with lines; the snout, legs, and abdomen of a brick colour. 8. A native of Europe. Very troublesome to cattle; about the size of the common fly; wings pale.

* *lineata*. Thorax marked with lines; abdomen black, marked on the sides with yellow spots. 9. A native of Europe. The lip long, yellow, with a black emarginated tip, and formed of a horny substance enclosing the proboscis. The antennæ black, with a rusty-coloured knob, and furnished with a bristle; the thorax marked with four white lines; the scutellum of a brick colour; wings whitish; legs yellow; the thighs marked with a white belt.

Only 9 species of this genus have been described by Gmelin in the last edition of the System of Nature.

102. CONOPS.

Mouth furnished with a projecting snout, which is bent with an angular flexure. Antennæ clavated, and pointed at the extremity.

The insects of this genus live by sucking the blood and juices of other animals.

A. *Sucker furnished with a short valve of one piece, and with a single bristle.*

Blackish; back part of the head vesicular, the abdomen yellowish and black at the base. 4. A native of Europe; in groves.

Black; six segments of the abdomen yellow on the edges; antennæ and legs reddish. 5. A native of Europe; in groves.

B. *The Sucker bent both at the middle and at the base, with an angular flexure. Sheath consisting of two pieces, the two pieces which compose the Sheath equal.* Myopæ.

Of a rusty colour; the abdomen cylindrical, and bent inwards; the forehead reddish. 8. A native of Europe; in groves.

Abdomen cylindrical, and bent inwards; body black. 2. A native of Europe; among bushes.

14 species of this genus are described in the edition of the System of Nature published by Gmelin.

103. ASILUS.

Mouth furnished with a sucker, composed of a horny substance, projecting, straight; consisting of two pieces, and turgid at the base. Antennæ filiform.

They prey on other insects, especially those of the *lepidopterous* and *dipterous* orders.

The abdomen hairy; on the fore part there are three segments black; behind yellow and bent inwards.

4. A native of Europe. The larva lives under ground. This is the largest species of the genus which is to be met with in Britain. Its sting is very painful.

Hairy, black; the thorax white at the base. 19. A native of Europe.

Hairy, black; with a whitish band. 7. A native of Europe. It rests by leaning on its breast, with its legs spread. Claws white.

Black; wings black; the forehead white. 22. A native of Europe. Band and wings wholly black.

Of an ash colour, without hairs; legs of a rusty colour; feet black. 14. A native of Europe.

Black; the thorax marked on each side with an ash-coloured line; the poisers yellow. 44. A native of Europe.

Gmelin has described 48 species of this genus, in his last edition of the System of Nature.

104. BOMBYLIUS, *Buz-fly*.

Mouth furnished with a sucker, very long, setaceous, straight, and composed of two valves, the valves unequal, and likewise with three bristles. Feelers two, short, and hairy. Antennæ tapering towards the point, and connected at the base.

The species of this genus feed on the nectarious juice of flowers which they collect when on wing.

Humble

- * *major*. *Humble Bee*. Wings with a broad black waved outer edge; body black, with thick yellowish down. 1. A native of Europe.
- * *medius*. Wings dotted with brown; body yellowish and white behind. 2. A native of Europe. It is to be met with very early in the spring.
- minimus*. Wings brownish at the base; body yellowish, and hairy; snout and legs black. 7. A native of Europe. Very small; antennæ black; wings white.
- griseus*. Hairy; wings white, brown at the base; thorax black, marked with white lines; abdomen gray. 11. A native of Europe; on compound flowers. Wings marked with two black dots in the middle.
- virescens*. Wings white, without spots; body hairy, and greenish; the snout short. 12. A native of Europe; on flowers. Thickly covered with greenish hairs.

There are 15 species of this genus described in the last edition of the System of Nature.

105. HIPPOBOSCA.

Mouth furnished with a short, cylindrical, straight sucker, composed of two equal pieces. Antennæ filiform. Legs furnished with many claws.

The species of this genus live on the blood of other insects.

- * *equina*. *Horse-fly*. Wings obtuse; thorax variegated with white; legs terminating in four claws. 1. A native of Europe and America.—They are very troublesome to horses; they hide themselves under the hairs, and attach themselves firmly to the skin, by means of their crooked claws.
- * *avicularia*. Wings obtuse; thorax of one colour. 2. A native of Europe; on the bodies of various birds, especially swallows. Wings longer than the body by one half, marked with black veins; the hind part of the abdomen flattened and dotted.
- * *hirundinis*. Wings tapering towards the extremity; legs terminating in six claws. 3. A native of Europe; on the bodies and nests of swallows.
- * *ovina*. No wings. 4. A native of Europe; among the wool of sheep. The abdomen distended, pale, obtuse, marked on each side with a double waved white line, and on the back with a red spot; legs hairy, the claws set in pairs.

There have been only five species of this genus hitherto described.

VII. APTERA.

WINGS none in either sex.

106. LEPISMA.

Mouth furnished with four feelers, two setaceous, and two capitated. Lip membranaceous, round, and emarginated. Antennæ setaceous. Body covered with scales laid over one another, like tiles on the roof of a house. Tail furnished with bristles. Legs six, formed for running.

These in their various stages of existence prey upon

fugar, decayed wood, and putrid substances. The larvæ and pupæ are six-footed, active, and swift.

Scaly, and resembling silver; tail triple. 1. A native of America; among fugar. They have been introduced into Europe, and are frequently to be met with among books and furniture. They run very quickly, and are not easily caught. Antennæ whitish, of the same length with the body. It is furnished with two scutella which enclose the thorax; two segments of the abdomen less than the rest; the tail furnished with three long bristles standing at a distance from each other, and with two pair of very small ones under the anus.

Leaping; tail triple; segments of the abdomen hairy on each side beneath. 2. A native of Europe; in sandy situations, among stones and rubbish, and takes prodigious leaps by means of the springs under its tail; brownish, the antennæ the length of the body; the fore feet placed very near the mouth; each segment of the abdomen is furnished with a spine beneath.

Naked; tail triple. 3. A native of Europe. It resembles the *podura*, but larger, wholly white, and cylindrical; the antennæ obtuse, and half the length of the body.

There are seven species of this genus described by Gmelin.

107. PODURA, *Spring-tail*.

Mouth furnished with four feelers, slightly clavated; the lip divided. Eyes two, composed of eight facets. Tail forked, bent under the body, and acting like a spring. Legs six, formed for running.

The insects of this genus, through all their stages, feed on vegetables. The larva and pupa have six feet, and are active, and very much resemble the perfect insect.

Nearly globular, and green. 1. A native of Europe; on plants of different kinds, especially on the seminal leaves of the buck-wheat (*polygonum fagopyrum*).

Oblong, and ash-coloured, with black marks. 6. *nivalis*. A native of Europe; among bushes, in wood. It is frequently to be seen in the winter on the snow, in the footsteps of men and other animals.

Black, and lives in water. 12. A native of Europe. Assembles in troops, early in the morning, on the banks of pools and fish ponds.

White; lives on land. 13. A native of Europe; found very early in the spring on recently ploughed land.

31 species of this genus have been described in the last edition of the System of Nature.

108. TERMES, *White Ant*.

The mouth furnished with two jaws, formed of a horny substance. Lip formed likewise of a horny substance; is divided into four, the division linear and sharp. Feelers four, equal and filiform. Antennæ moniliform in most species. Eyes two.

These insects might with more propriety be placed under

under the order *Neuroptera*, or *Hymenoptera*, most of them having either two or four wings in the perfect state. They are very destructive, and destroy provisions, cloths, furniture, books, and timber of whatever magnitude, leaving a thin shell not thicker than paper; in houses they are not only troublesome, but dangerous, as they destroy the beams which support the floors and roofs, and occasion them to fall in.

fatale.

Brown above; the thorax is composed of three segments; wings pale, furnished with a rib or nerve of a brick colour. 1. A native of India and Africa. Larva small, about a quarter of an inch long, furnished with six feet, pale, with a roundish brick-coloured head, without eyes; mandible short and strong, antennæ as long as the thorax; the abdomen oval. Pupa larger; about half an inch long, with a very large oval polished head, without eyes; jaws projecting, as long as the head, forked, without teeth, sharp and black; thorax and abdomen palish. The perfect insect both male and female has a brown head, antennæ yellowish and globular, prominent black eyes, the segments of the thorax margined, the abdomen variegated with white streaks, wings twice the length of the body, legs yellowish. Of the white ant we have a very curious and interesting description, in the Philosophical Transactions for 1781, by Mr Henry Smeathman of Clement's Inn. According to this account, the works of these insects surpass those of the bees, wasps, beavers, and other animals, as much at least as those of the most polished European nations excel those of the least cultivated savages. With respect to the interior construction, and the various members and dispositions of the parts of the building, they may come into comparison with some of the most celebrated works of man himself. The most striking parts of these structures are the royal apartments, the nurseries, magazines of provisions, arched chambers and galleries, with their various communications; the ranges of Gothic shaped arches, projected, and not formed by mere excavation, some of which are two or three feet high, but which diminish rapidly, like the arches of aisles in perspective; the various roads, sloping staircases, and bridges, consisting of one vast arch, and constructed to shorten the distance between the several parts of the building, which would otherwise communicate only by winding passages. In some parts near Senegal, their number, magnitude, and close arrangement, make them appear like the villages of the natives. But these and many other curious instances of the great sagacity and powers of these insects cannot be understood, without viewing the plates in which their feeble frames, and comparatively, stupendous works are delineated. See Phil. Trans. above referred to. The economy of these industrious insects appears to have been very attentively observed by the ingenious author, as well as their buildings. There are three distinct ranks or orders of them, constituting a well regulated community. These are, first, the larvae, labourers, or working insects; second, the pupæ, soldiers, or fighting order, who do no kind of labour, and are about twice as long as the former, and equal in bulk to about fifteen of them; and lastly, the winged or perfect insects, which may be called the nobility of the state, for they neither labour nor fight, being scarcely able to defend themselves. These only are capable of being elected kings or queens; and nature has so ordered it,

that they emigrate within a few weeks after they are elevated to this state, and either establish new kingdoms, or perish within a day or two. The first order, the working, are most numerous, being in the proportion of 100 to one soldier. In this state they are about a quarter of an inch in length, and twenty five of them weigh about a grain, so that they are not so large as some of our ants. See plate DI. fig. 1. and 2. The second order, or soldiers, have a very different form from the labourers, and have been by some authors supposed to be the males, and the former the neuters; but they are in fact, the same insects as the foregoing, only they have undergone a change of form, and approached nearer to the perfect insect. They are now much larger, being half an inch long, and equal in bulk to 15 of the labourers, (fig. 3. and 4). The third order, the insect in its perfect state, varies its form still more. The head, thorax, and abdomen, differ almost entirely from the same parts in the labourers and soldiers; and besides this, the animal is now furnished with four fine large brownish, transparent wings, with which it is at the time of emigration to wing its way in search of a new settlement. It differs so much from the other two, that they have not hitherto been supposed to belong to the same community. In fact, they are not to be discovered in the nest, till just before the commencement of the rainy season; when they undergo the last change, which is preparative to the formation of new colonies. They are equal in bulk to two soldiers, and about 30 labourers (see fig. 5), and by means of the wings with which they are furnished, they roam about for a few hours, at the end of which time they lose their wings, and become the prey of innumerable birds, reptiles, and insects; while probably not a pair out of many millions of this unhappy race, get into a place of safety, fulfil the first law of nature, and lay the foundation of a new community. In this state, many fall into the neighbouring waters, and they are eaten with avidity by the Africans. The author found them delicate, nourishing, and wholesome, without sauce or other help from cookery, than merely roasting them in the manner of coffee. The few fortunate pairs who happen to survive this annual massacre and destruction, are represented by the author as being casually found by some of the labourers, that are continually running about on the surface of the ground, and are elected kings and queens of new states. Those who are not so elected and preserved, certainly perish, and most probably in the course of the following day. By these industrious creatures, the king and queen elect are immediately protected from their innumerable enemies, by being inclosed in a chamber of clay, where the business of propagation soon commences; their voluntary subjects, then employed in constructing wooden nurseries, or apartments entirely composed of wooden materials, seemingly joined together with gum. Into these, they afterwards carry the eggs produced from the queen, lodging them there as fast as they can obtain them from her. The author even furnishes us with plausible reasons to believe, that they here form a kind of garden for the cultivation of a species of microscopical mushrooms, which Mr Konig, in an Essay on the East Indian Termites, read before the society of naturalists of Berlin, conjectures to be the food of the young insects. But perhaps the most wonderful, and at the same

same time best authenticated part of the history of these singular insects, is that which relates to the queen or mother of the community in her pregnant state. After impregnation, a very extraordinary change begins to take place in her body, or rather in her abdomen only. It gradually increases in bulk, and at length becomes of such an enormous size as to exceed the bulk of the rest of her body 1500 or 2000 times. She becomes 1000 times heavier than her consort, and exceeds 20,000 or 30,000 times the bulk of one of the labourers. In this state, the matrix has a constant peristaltic or undulating motion, the consequence of which is (as the author has counted them), (fig. 8.) the protrusion of a great many thousands of eggs in twenty-four hours. These eggs, says the author, are instantly taken from her body by her attendants, of whom there always are a great number in the royal chamber and the galleries adjacent, and carried to the nurseries, which are sometimes four or five feet distant in a straight line. Here, after they are hatched, the young are attended and provided with every thing necessary, until they are able to shift for themselves, and take their share of the labour of the community. Many curious and striking particulars are related of the great devastations committed by this powerful community, which construct roads, or rather covered ways, diverging in all directions from the nest, and leading to every object of plunder within their reach. Though the mischiefs they commit are very great, such is the economy of nature, that it is probably counterbalanced by the good produced by them, in quickly destroying dead trees, and other substances, which, as the author observes, would by a tedious decay, serve only to encumber the surface of the earth. Such is their alacrity and dispatch in this office, that the total destruction of deserted towns is so effectually accomplished, that in two or three years a thick wood fills the space, and not the least vestige of a house is to be discovered. From the many singular accounts here given of the police of these insects, we shall mention one respecting the different functions of the labourers and soldiers, or the civil and military establishments in this community, on an attempt to examine their nest and city.

On making a breach in any part of the structure with a hoe or pickaxe, a soldier immediately appears and walks about the breach, as if to see whether the enemy has gone, or to examine whence the attack proceeds. In a short time he is followed by two or three others, and soon after by a numerous body, who rush out as fast as the breach will permit them, their numbers increasing as long as one continues to batter the building. During this time they are in the most violent agitation and bustle, while some of them are employed in beating with their forceps upon the building, so as to make a noise that may be heard at three or four feet distance. On ceasing to disturb them, the soldiers retire, and are succeeded by the labourers, who hasten in various directions to the breach, each with a burden of mortar in his mouth ready tempered. Though there are millions of them, they never stop to embarrass each other; and a wall gradually arises that fills up the chasm. A soldier attends every 600 or 1000 of the labourers, seemingly as a director of the works; for he never touches the mortar, either to lift or carry it. One in particular places himself close to the wall

VOL. VIII. Part I.

which they are repairing, and frequently makes the noise above mentioned; which is constantly answered by a loud hiss from all the labourers within the dome; and at every such signal they evidently redouble their pace, and work as fast again. The work being completed, a renewal of the attack constantly produces the same effects. The soldiers again rush out and then retreat, and are followed by the labourers loaded with mortar, and as active and diligent as before. Thus, says the author, the pleasure of seeing them come out to fight or to work alternately may be obtained as often as curiosity excites or time permits; and it will certainly be found, that the one order never attempts to fight, or the other to work, let the emergency be ever so great. The obstinacy of the soldiers is remarkable. They fight to the very last, disputing every inch of ground so well as often to drive away the negroes, who are without shoes, and make the white people bleed plentifully through their stockings. Such is the strength of the buildings erected by these puny insects, that, when they are raised to little more than half their height, it is always the practice of the wild bulls to stand as sentinels upon them while the rest of the herd is ruminating below. When at their full height of ten or twelve feet, they are used by Europeans as places to look out from over the top of the grass, which here grows to the height of thirteen feet, upon an average. The author has stood with four men on the top of one of these buildings, in order to get a view of any vessel that might come in sight. These termites indeed are frequently pernicious to mankind, but they are also very useful and even necessary; one valuable purpose which they serve is to destroy decayed trees and other substances, which, if left on the surface of the ground in hot climates, would in a short time pollute the air. In this respect they resemble very much the common flies, which are regarded by mankind in general as noxious, and at best as useless beings in the creation; but it is certainly for want of consideration. There are not probably, in all nature, animals of more importance; and it would not be difficult to prove, that we should feel the want of one or two species of large quadrupeds much less than one or two species of these despicable looking insects. Mankind, in general, are sensible that nothing is more disagreeable than putrid substances, and nothing more pestiferous.

Of a brick colour above; head black; antennæ yellow. *destructor.*
low. 4. A native of America, Africa, and India. They build strong oval nests round the branches of trees. It very much resembles the *T. fatale*, but is only half the size, the lower stemmata are impressed with a dot on the centre; wings brownish, marked with a yellowish rib. Larva pale brown; head black, conic, and projecting forwards.

Black; segments of the abdomen tipped with white; *arda.*
legs pale. 5. A native of Africa; and resembles in economy the *T. fatale*. It builds a nest of a cylindrical shape, two or three feet high, of brown clay and vegetables mixed up together, with a round vaulted dome, surrounded by a prominent terrace. Larvæ or labourers have a pale head, without eyes; mandibles short, furnished with teeth; thorax and abdomen oval, grayish lead colour; legs of a brick colour. Pupæ or guards have a very large brick-coloured head, clavated and swelling out before, oval and extended behind; mandible

mandible projecting and forked; antennæ of a brick colour, as long as the head, without eyes; thorax small; abdomen oval, grayish lead-colour; legs of a brick colour. Perfect insect less than the former ones, with incumbent black wings, and pale brick-coloured legs.

mordax. Black; segments of the abdomen tipped with white; legs black. 6. A native of Africa. Builds cylindrical houses. Larva and pupa like the last, but much less.

capense. Pale yellow; wings transparent, edged with brown. 7. A native of India and Africa. Larva furnished with two black eyes; and wanders about in the daytime in troops like the common ant.

fatidicum. Abdomen oval; mouth pale; eyes brown; antennæ fetaceous. 3. A native of Europe.

* *pulsatorium.* Abdomen oblong; mouth red; eyes yellow; antennæ fetaceous. 3. A native of Europe and America. Frequent in houses, in old books, wood, decayed furniture, museums, and is rarely found with wings. The female beats like the ticking of a watch, and is often mistaken for the *pinus pulsator*.

divinatorium. Abdomen transversely furrowed; mouth brown; eyes black. 7. A native of Europe; found in books, and is very active and lively. Body whitish.

These eight species are all that have been described by Gmelin: other two, the *morio* and *flavicolle*, have been described since.

106. PEDICULUS. *Louse.*

Mouth furnished with a sucker, which the insect can stretch out or draw back at pleasure; without feelers or proboscis. Antennæ of the same length with the thorax. Eyes two. Abdomen flatfish. Legs six, formed for running.

The insects of this genus live by sucking the juices of animals. The larvæ and pupæ have six feet, and are active, resembling the perfect insect.

* *humanus* Abdomen ash-coloured, and lobed. 1. There are two varieties of this species, the one softer and whiter, occupying the body and clothes, the other harder and darker-coloured occupying the heads of those that do not attend to cleanliness, particularly of children.

The louse which infests the human body makes a very curious appearance through a microscope. It has such a transparent shell or skin, that we are able to discover more of what passes within its body than in most other living creatures. It has naturally three divisions, the head, the breast, and the tail-part. In the head appear two fine black eyes, with a horn that has five joints, and is surrounded with hairs standing before each eye, and from the end of the nose or snout there is a pointed projecting part, which serves as a sheath or case to a piercer or sucker, which the creature thrusts into the skin to draw out the blood and humour which are its destined food; for it has no mouth that opens in the common way. This piercer or sucker is judged to be 700 times smaller than a hair, and is contained in another case within the first, and can be drawn in or thrust out at pleasure. The breast is very beautifully marked in the middle; the skin is transparent, and full of little pits: and from the under part of it proceed six legs,

each having five joints, and their skin all the way resembling shagreen, except at the ends, where it is smoother. Each leg terminates by two claws, which are hooked, and are of an unequal length and size. These it uses as we would a thumb and middle finger: and there are hairs between these claws as well as all over the legs. On the back part of the tail there may be discovered some ring-like divisions, and a sort of marks which look like the strokes of a rod on the human skin: the belly looks like shagreen, and towards the lower end it is very clear and full of pits: at the extremity of the tail there are two semicircular parts all covered over with hairs, which serve to conceal the anus. When the louse moves its legs, the motion of the muscles, which all unite in one oblong dark spot in the middle of the breast, may be distinguished perfectly, and so may the motion of the muscles of the head when it moves its horns. We may likewise see the various ramifications of the veins and arteries, which are white, with the pulse regularly beating in the arteries. But the most surprising of all the sights is the peristaltic motion of the guts, which is continued all the way from the stomach down to the anus. If one of these creatures be placed on the back of the hand, when hungry, it will thrust its sucker into the skin; the blood which it sucks may be seen passing in a fine stream to the fore part of the head, where falling into a roundish cavity, it passes again in a fine stream to another circular receptacle in the middle of the head; from thence it runs through a small vessel into the breast, and then to a gut which reaches to the hinder part of the body, where, in a curve it turns a little upwards; in the breast and gut the blood is moved without intermission with a great force, especially in the gut, where it occasions such a contraction of the gut, as is very surprising. In the upper part of the crooked ascending gut above mentioned, the propelled blood stands still, and seems to undergo a separation, some of it becoming clear and watery, while other black particles are pushed forwards to the anus. If a louse is placed on its back, two bloody darkish spots appear, the larger in the middle of the body, the lesser towards the tail: the dark bloody spot, in or over which the bladder seems to lie. This motion of the systole and diastole is best seen when the creature begins to grow weak; and on pricking the white bladder, which seems to be the heart, the creature instantly dies. The lower dark spot is supposed to be the excrement in the gut.

The posterior part of the abdomen emarginated; legs * *pubis*. formed like claws. 2. A native of Europe. It is found about the hairs of the groin, and sometimes, though rarely, on the eyebrows of people who do not attend to cleanliness. The antennæ have five articulations; the hind part of the abdomen hairy.

The abdomen orbicular, marked with a white line; *ricinoides*. scutellum composed of three lobes; the snout white. 3. A native of America. It gets into the legs of the naked inhabitants, where it draws blood, and depositing its eggs in the wound occasions foul and malignant ulcers.

8. A native of Europe; on sheep.

The abdomen is marked with eight transverse rusty-*ovis*. coloured lines. 9. A native of Europe; on horned *bovis*. cattle.

66 species of this genus are described in the last edition of the System of Nature, all of which occupy the bodies of different animals.

II. PULEX, Flea.

Mouth without jaws or feelers. The snout long, and bent inwards. A sheath of two pieces, consisting of five articulations, covered at the base with two oval scales, and furnished with a single bristle. Lip round, fringed with sharp points, which are bent backwards. Antennæ moniliform, projecting, and becoming thicker towards their outer side. Eyes two. Abdomen compressed. Legs six, formed for leaping.

The genus *pulex* is rather doubtful; it approaches in many respects to the insects of the order hemiptera. They live on the juice and blood of other animals. Larva without feet, cylindrical, active, and furnished with two spines under the tail.

** irritans.* The snout shorter than the body. 1. This familiar insect is to be met with everywhere; it lives by sucking the blood of other animals, and is very troublesome to many of them, especially to the hare and rabbit. They deposit smooth round eggs at the roots of the hair of the animals on which they feed, on blankets, and articles made of wool, fur, &c. From these eggs are hatched the larvæ, resembling small white shining worms, which feed on the scurfy substance adhering to the cuticle of animals, or on the downy matter collected on clothes. About a fortnight after they are hatched, they acquire a considerable size, and become very active; when disturbed they roll themselves up into a ball. After they have acquired their full size, they retire into some undisturbed situation; they form small bags for themselves composed of silky threads, which they spin from their mouths. These bags are very white internally; but on the outside, they are of the colour of dust, and are very little discernible. They remain in the state of pupa about 14 days. It continues to be of a white colour till the second day before its escape from the bag, when it acquires a dark colour, becomes firmer, and is transformed into a perfect insect.

The flea, when viewed in the microscope, exhibits a very singular appearance. It is covered all over with black and hard scales, which are curiously jointed, and folded over one another, so as to comply with all the nimble motions of the creature. These scales are polished, and are beset about the edges with short spikes in a very beautiful and regular order. Its neck is finely arched, and somewhat resembles the tail of a lobster. Its eyes are very large and beautiful. The sucker contains a couple of lances or darts; which, after the sucker has made an entrance, are thrust farther into the flesh, to make the blood flow from the adjacent parts, and occasion that round red spot, with a hole in the centre of it, which remains for some time after the puncture of a flea, commonly called *flea-bite*. A proper view of the sucker with its two lances is not easily obtained, as the insect puts out its sucker only at the time of feeding. The best way of obtaining a view is to cut off the head, and subject it to the microscope by itself. There is an hospital at Surat where a number

of fleas are kept, and some poor creature, for pay, allows himself to be fixed down and fed upon by them.

Chigur. Snout of the same length with the body. *penetrans.*

2. A native of America. This insect is very troublesome in the sugar colonies, penetrating into the feet of the inhabitants, where it lodges its eggs and causes malignant ulcers. Body reddish brown. The female produces a very great number of eggs, and when pregnant the abdomen swells to 100 times the size of the rest of the body. It penetrates chiefly under the nails of the toes, and eats its way onwards, depositing its eggs, which are exceedingly minute, in a bag. It is discovered by the uneasy itching it occasions, and must be extracted with great caution and dexterity; for if the bag be burst, and if any of the eggs or animals remain, a very troublesome ulcer ensues, which sometimes renders the limb useless. The slaves who go barefooted are chiefly exposed to this calamity, and they are most dexterous at extracting them.

There are only two species of this genus described in the last edition of the System of Nature published by Gmelin.

III. ACARUS, Tick or Mite.

Mouth without a proboscis. The sucker with a cylindrical sheath, composed of two pieces. Feelers two, compressed, equal, and of the same length with the sucker. Eyes two, placed on the sides of the head. Legs eight.

The insects of this genus are very minute, and very prolific; they abound everywhere; most of them live on the juices of other animals. The larva and pupa have six feet, (those of the division *trombidium* have eight feet); they are active, and very much resemble the perfect insect.

A. The Antennæ are filiform, compressed, and of the same length with the Legs.

Transparent; convex above and flattened beneath; *ursellus.* marked in the middle with a blackish spot. 36. It is very common in waters, on the *mucus* which covers the spawn of frogs. Very small, slow, inoffensive, and legs terminating in three nails.

Oval, almost globular; abdomen marked at the base ** ricinus.* with a round brown spot; antennæ clavated. 7. A native of Europe; it is very common on oxen and dogs.

Second pair of legs very thick. 8. A native of ** crassipes.* Europe; and very common. It is active, gregarious, frequently to be found in gardens among the earth in spring.

Thorax angularly cruciform; the legs terminating in ** vespertilio.* hooks, and longer than the body. 9. It is found on *lionis.* the body of the bat (*vespertilio murinus*) of an uncommon figure, resembling the *phalangium*. It cannot walk on a flat surface.

Commonly called *Red Spider.* Transparent and red-*tularius.* dish; the abdomen marked on each side with a brown spot. 14. A native of Europe; on various plants, particularly those that are not exposed to the weather, or shut up in hot-houses. It forms webs of parallel threads, by which it sometimes suffocates plants in green-houses.

It is frequently to be found on the leaves of the lime-tree in autumn.

* *firo.*

Cheese-Mite. Whitish; head and thighs of a rusty colour; the abdomen bristly. 15. A native of Europe; in flour, cheese, &c. which have been long kept. The cheese mite is a very minute species; to the naked eye they appear like moving particles of dust. But the microscope shows them to be perfect animals, having as regular a figure, and performing all the functions of life as perfectly, as creatures that exceed them far in size. The head is small in proportion to the body, and has a sharp snout; they have two small eyes, and are very quick-sighted, when they have once been touched by a pin, they artfully avoid another touch. The extremity of their legs are furnished with two little claws, with which they take hold of any thing. The hinder part of the body is plump and bulky, and ends in an oval form, from which issue out some long hairs. Other parts of the body are thinly beset with long hairs. The males and females are easily distinguished. The females are oviparous; and from their eggs the young ones are hatched, in the space of 12 or 14 days in warm weather, but in colder weather longer time becomes requisite. They are very minute when first hatched, and cast their skin several times before they arrive at their full growth, but do not materially change their appearance. They are very tenacious of life, and may be kept alive several months without food. Mr Leeuwenhoek had one that lived 11 weeks on the end of a pin, on which he had fixed it for microscopical observations. They may be kept a long time between two concave glasses, and occasionally subjected to the microscope. In this way they may be seen *in coitu*, conjoined tail to tail, and this is performed by an incredibly swift motion. They are very voracious animals, and have been often seen eating one another. Their manner of eating is by thrusting one jaw forward and drawing the other back alternately, and in this manner, as it were, grinding their food; after they have done feeding they seem to ruminate.

* *scabiei.*

Itch-insect. White; legs reddish; the four posterior legs are furnished with a very long bristle. 50. In the pustules occasioned by the itch. It is generally thought to be the cause of the itch, though some hold a contrary opinion; the manner, however, in which the itch is communicated, seems to confirm the former opinion.

* *lactis.*

Abdomen oval and obtuse, furnished with four bristles the same length with the body, which incline downwards. 16. It is found in cream that has been long kept, and in milk vessels that have not been kept clean.

dysentericæ

Legs furnished with two bristles; the abdomen oval, furnished behind with four horizontal bristles of the same length with the body. 17. It is found in casks and vats, in which beer has been kept; they are most frequently found about the top or near any chink in the vessel; they are likewise found very frequently within the cask, and are said to walk about on the top of the beer from 10 o'clock at night till 10 o'clock in the morning; during the day they conceal themselves in the chinks of the cask.

* *baccarum.*

The abdomen turgid and red, and dark-coloured on the sides. 23. It is found on the fruit of the corinth and gooseberry.

The abdomen reddish; the hind-legs very long and * *muscofiliform.* 24. A native of Europe; on different species *rum.* of flies.

Abdomen red, marked on each side with scarlet * *gymnospots.* 26. It is to be found on bees, wasps, dragon-*terorum.* flies, &c.

Oval, and reddish; the anus whitish. 27. It is * *coleop-* found on many insects, particularly on the common *tratorum.* black beetle; which, on that account, has been called the *lousy beetle*: they run very quickly.

The posterior part of the abdomen crenated; the *scu-sanguis-* tellum oval, and somewhat tawny; the snout divided *in-* to three. 6. A native of America; they fix on the *gus.* legs of travellers and suck the blood; they adhere so closely, that they are removed with difficulty; the fore-legs are furnished with short prickles, near their junction with the body.

The first pair of legs very thick, and furnished *eruditus.* with claws; the second pair very long, and furnished with two bristles at the extremity. 62. Found in books kept in damp places, particularly about the backs, where the sheets have been glued together. It is very injurious, and not visible without the help of a glass.

Hemispherical, pale, and smooth. Legs equal. 31. *acarorum.* It is found in troops on the body of the *acarus cras-* *sipes.*

Oval; furnished with several long hairs at the ex-*destructor.* tremity of the abdomen; the legs are furnished with a single bristle. 61. Found on the bodies of insects and other subjects of natural history which are kept in too moist places, and is more destructive to museums than even the *ptinus fur*, and not visible to the naked eye.

B. *Antennæ setaceous.* Trombidia.

The abdomen hairy, red, and obtuse behind; the *inctorius.* fore legs whiter than the rest. 20. A native of Surinam and Guinea; very hairy; it becomes white when immersed in spirits of wine.

The abdomen of a blood colour, flat, and downy, * *holoseri-* turned up behind. 22. A native of Europe and *ceus.* America; is said to be poisonous if swallowed.

82 species of this genus have been described in the last edition of the System of Nature.

112. HYDRACHNA.

Head, thorax, and abdomen united. Feelers two, jointed. Eyes two, four, or six. Legs eight.

The insects of this genus are inhabitants of the water, swim with great velocity, and prey on the larvæ of *tipulæ* and *monoculi.* They deposit red spherical eggs, which in about a month acquire a lunar form, and produce six-footed larvæ furnished with a single proboscis, which, after they have changed their skin several times, become perfect insects furnished with eight feet.

A. *Eyes two.** *Those which are furnished with a Tail.*

Globular; eyes red. 1. It is to be found in ditches * *globator.* containing water; male greenish and spotted; female bluish and without spots, and double the size of the male.

Oval,

buccinator. Oval, red, and black behind; furnished with a yellow cylindrical tail, and straightened at the base. 3. It is found on the banks of rivers; black beneath, eyes reddish, legs black.

papillator. Purple and globular, furnished with a papilla on each side of the tail; legs black. 12. It is to be found early in the spring in overflowed meadows.

** Furcatæ. Back marked with a fork.

crassipes. White and oval; the disk black and marked with a reddish fork, and furnished with papillæ near the anus; fore legs thick. 13. It is found in fish ponds and ditches containing water; the legs twice or thrice the length of the body, which renders it easily to be distinguished. It is transparent; breast whitish; eyes black; when walking freely, it directs its legs forwards; after it has gone a few steps, it extends its legs horizontally, and rests as if it were dead, and a little afterwards it renews its motion.

clavicornis. Reddish and oval; marked with a yellow fork, feelers-clavated, legs pale. 15. It is found in marshes; eyes small and black, feelers and legs white.

*** *Glabræ*.

despiciens. Round and red, marked with several spots; the eyes placed on the under part of the body. 23. It is to be found in ditches full of water; it resembles the *H. maculata* in every respect, except the positions of the eyes; flattish, wrinkled, full of dimples, marked with nine spots; eyes blackish; legs yellowish.

versicolor. Nearly square, marked with white, blue, and brown spots. 44. It is found in places overflowed with water; white above, brown beneath, edge yellowish; the feelers and legs white and transparent.

B. *Eyes four*.

calcareæ. Round, brown, and very white in the middle. 45. It is to be found, though rarely, in moist places; eyes black, feelers pointed, legs pale and transparent.

maculata. Oval and red; marked on the back with black spots. 48. It is found in wet ditches; shining; eyes black; legs yellow and transparent; feelers yellow, sometimes long, sometimes short.

C. *Eyes six*.

**umbrata*. Round and red, marked with several spots. 49. It is found in woody marshes; smooth, somewhat depressed, marked with more than ten obscure spots, blackish beneath; eyes black; feelers very small, tipped with black; legs yellow.

49 species of this genus have been described in the last edition of the System of Nature.

93. PHALANGIUM.

Mouth furnished with two filiform feelers; the mandible composed of a substance like horn; the second joint furnished with a sharp tooth, moveable, and furnished with a claw. Antennæ none. Two eyes on the top of the head contiguous, and two lateral eyes. Legs eight. Abdomen (for the most part) round.

The insects of this genus in their various stages of transformation prey on the smaller insects and worms;

the larvæ have eight feet, active, and resemble the perfect insect.

A. *Sucker, a conical tube*. Pycnogona.

Feelers four; body filiform; legs very long. 1. A **grossipes*. native of the north of Europe; found on the Norwegian seas; very slow, and very minute; it is composed of several articulations, and has a very narrow linear tail; it enters the shells of muscles, and consumes their contents.

Feelers two; body oval. 6. It is found in the **balena*-north seas, under stones; it is red on the back, the *rum*. sucker projecting, straight, obtuse at the extremity, and perforated with a round entire perforation; the feelers inserted at the base of the sucker, and almost equalling it in length; the legs jointed and angular.

B. *Without a sucker*.

Body oval and black; the under part of the body *morio*. and legs pale. 10. A native of Europe; it is to be found on rocks.

Long-legged spider, or shepherd's spider. Abdomen **opilio*. oval and gray, beneath white. A native of Europe and America; wandering about in the night time.

Abdomen inverted, oval and flattish; claws smooth, **cancroides*. the fingers hairy. 4. A native of Europe; in confined shaded places, in boxes and damp cellars; it feeds on *termites* and *mites*, and moves like a crab; it is destructive to collections of dried plants; it likewise enters the skin of the human body, and excites a very painful pimple about the size of a pea.

Abdomen cylindrical, the claws smooth; head furnished with an appendage. 5. A native of America; in confined places in tropical countries. Its bite is said to be dangerous; yellowish, the claws oval.

Claws notched, and hairy; body oblong. 15. A *araneoides*. native of Italy, Africa, Persia, and the southern shores of the Volga; its bite occasions very violent pain, livid tumors, delirium, and sometimes death; soft, lurid, and woolly; the claws very turgid.

15 species of this genus have been described by Gmelin in the last edition of the System of Nature.

114. ARANEA, Spider.

Mouth furnished with short horny jaws; the lip round at the tip. Feelers two, bent inwards; jointed and very sharp at the extremity: in the males they are clavated, and have the organs of generation placed in them. Antennæ none. Eyes eight; sometimes six, though seldom. Legs eight. The anus is furnished with papillæ, with which the insect spins threads, and forms its web.

These insects, through every stage of their existence, prey upon other insects, especially those of the order *Diptera*; they even do not spare those of their own genus or species: from the papillæ at the end of the abdomen they throw out at pleasure a number of fine threads, which they unite in various ways for the purpose of entangling their prey. They every year cast their old skin, which they perform by suspending themselves in some solitary corner, and creeping out of it. The young ones have the power of ascending the air to

a great height; to accomplish which, they climb up some eminence, and are wafted about by the winds, filling the air with their threads. They are destroyed by the sphex and ichneumon.

Linnaeus has subdivided this genus according to the number and position of their eyes.

A. Eyes eight.

1. Eyes placed thus, :::

fasciata. Of a silver colour; the abdomen marked with yellowish bands; the legs surrounded with brown rings. 48. A native of the island of Madeira.

* *diadema.* Abdomen nearly globular and reddish; brown, marked with a white cross composed of dots. 1. A native of Europe, on trees; it is a very beautiful insect.

* *aquatica.* Brown; abdomen oval and of an ash colour; the back brown, marked with two dots. 39. A native of Europe, in stagnant waters, where it dives to the bottom in search of its food. It takes up its winter quarters in an empty snail shell, the aperture of which it closes up with a web; jaws black, claws red.

2. Eyes placed thus, :::

latro. Thorax hairy, and of an ash colour; the abdomen oval, black, and spotted with red. 65. A native of America; large, the thorax oval, legs black, thighs pale.

* *domestica.* Abdomen oval and brown, marked with five black spots nearly contiguous, the anterior ones larger than the others. 9. A native of Europe, in houses, and about windows; feeds chiefly on flies.

3. Eyes placed thus,

* *globosa.* Black; sides of the abdomen of a blood red colour. 69. A native of Europe, in meadows.

4. Eyes placed thus,

argentata. Abdomen white, and brown behind, and marked round the edge with six small projections. 70. A native of South America.

5. Eyes placed thus, :::

fumigata. Abdomen oval and brown, marked at the base with two white dots. 16. A native of Europe, in meadows; it watches near the nests of the larvae of different insects, and waits their coming out, when it seizes on one after another, and sucks out their substance.

* *saccata.* Abdomen oval, of a brownish colour. 40. A native of Europe, in gardens, and carries its eggs behind it enclosed in a bag; legs livid, marked with unequal brown rings set close together.

6. Eyes placed thus, :::

extensa. Abdomen long, of a silver colour tinged with green, the legs extended longitudinally. 22. A native of Europe, in woods; its legs are applied closely to the branches.

aidulans. Shining black; the abdomen hairy and black. 73. A native of America; it forms a nest under ground, and spins a large cylindrical web, which is covered with a lid; its bite is very painful, and frequently occasions fever and delirium, which is soon removed by a

gentle sudorific; thorax marked with a large depressed circular spot; abdomen oval; legs equal.

7. Eyes placed thus, :::

Black, thorax marked with a white line on the back. * *dorsalis.* 79. A native of Britain.

Marked with triangular black spots on the back of *tarantula.* the abdomen; the legs spotted with black. 34. A native of the south of Europe, particularly Italy and Barbary. It is found in caverns in argillaceous soil; its bite was formerly supposed to be curable by nothing but music; though it occasions a great deal of pain, it is almost never fatal.

8. Eyes placed thus,

Oval and oblong; thorax hairy, white; abdomen and *pulchra.* legs black, marked with yellow bands. 33. A native of Europe.

9. Eyes placed thus,

Black, abdomen oval, forehead white, and leaps on *goezii.* its prey. 84. It is to be found frequently in woods about Vienna; abdomen marked with two compressed dots.

10. Eyes placed thus, :::

Thorax orbicular and convex, with a transverse central excavation. 31. It is a native of South America, among trees, where it preys upon the larger insects, and even small birds, dropping into their nests and sucking their blood and eggs; it is of so enormous a size that its fangs may be compared to the talons of a hawk, and its eyes are very large.

11. Eyes placed thus,

Of a grayish rusty colour, and slightly clouded; thorax globular, and slightly heart-shaped; abdomen somewhat triangular, and marked with a faint longitudinal cross. 85. A native of Europe, on oak and other trees; abdomen marked with four impressed dots on the back; papillæ three.

12. Eyes placed thus,

Abdomen oval, obtusely conic behind, variegated *conica.* with brown and white; beneath black. 86. A native of Europe, among bushes; it spins and spreads out a web, to the surface of which it attaches the insects it has ensnared, after it has sucked out their juice. Thorax black, slightly tinged with rusty colour, and nearly double behind; legs gray, marked with brown rings; abdomen marked with a whitish spot, beneath resembling a horse shoe; papillæ four.

13. Eyes placed thus,

Hairy; body oval, black, variegated with brown. *albifrons.* 99. A native of Europe.

B. Eyes six, placed thus, :::

Abdomen greenish, the sides yellow. 30. A native of Europe; in gardens.

C. Eyes

C. Eyes - - - -

* *holosericea*. Abdomen oval, oblong, and silky; marked underneath near the base with two yellow dots. 29. A native of Europe. It is found within the leaves of plants which it rolls up.

venatoria. Thorax orbicular, smooth and black; abdomen oval, downy and brown. 33. A native of America. It constructs a tenacious cylindrical nest about a foot in length, furnished with a lid.

96 species of this genus have been described by Gmelin, in the last edition of the System of Nature.

115. SCORPIO, *Scorpion*.

Legs eight; likewise two claws situated on the fore part of the head. Eyes eight; three placed on each side of the thorax, and two on the back. Feelers two, furnished with claws, and projecting. Lip bifid. Antennæ none. Tail long, jointed, terminating in a sharp crooked sting. On the under side, between the breast and abdomen, are two excrescences resembling combs.

Scorpions have been conceived to be the most malignant and poisonous of all animals. Though this opinion be now very generally exploded, there are none of the insects we are acquainted with so formidable. It is true the effect of their sting differs greatly, according to the circumstances of the constitution of the person receiving the wound, as well as of the animal itself, the heat of the climate in which it lives, and the degree of violence with which the wound may have been inflicted.

The common European scorpion certainly is not of so terrible a nature as is commonly supposed; its sting being very rarely productive of bad consequences. But the large scorpions of Africa, which are said to be nearly a foot in length, may well be supposed capable of inflicting a wound of the most severe pungency, and of the most dreadful malignity. The poison is evacuated through three very small *foramina* near the tip of the sting; viz. one on each side of the tip, and the other on the upper part. A diversity of opinion has subsisted among naturalists, relative to the slit or foramen in the fangs of spiders, through which their poison is evacuated; and the same variety of opinion has prevailed with respect to the *foramina* in the scorpion's sting. The celebrated Redi, assisted by the best microscopes he could procure, was not able to discover them, though he was well convinced of their existence, from having perceived the minute drop of poison exude from near the tip of the sting. Others have denied the existence of the *foramina*; but Valisnerius and Leeuwenhoek have both described two, viz. one on each side of the tip, and which in shape are inclining to triangular; besides these a third has sometimes been seen, so that the sting of the scorpion can with greater facility discharge its venom, than that of any other animal. The poison is whitish, and is contained in a small bladder near the tail. When this bladder is pressed, the poison may be seen issuing out through the *foramina* of the sting.

Maupertius has made many experiments with the scorpion of Languedoc, the results of which were by no means uniform. He provoked one to sting a dog in three places of the belly, where the animal was without

hair. In about an hour after the animal seemed greatly swollen and very sick. He then cast up whatever he had in his bowels, and for about three hours continued vomiting a whitish liquid. The belly was always greatly swollen when the animal began to vomit, but this operation always seemed to abate the swelling; thus alternating for the space of three hours. The poor animal after this fell into convulsions, bit the ground, dragged himself along on his forefeet, and at length died five hours after he had been stung. There was no partial swelling round the wound inflicted, as is usual after the sting of a wasp or bee; but the whole body was inflated, and there only appeared a red spot on the places stung. Two days afterwards the same experiment was tried on another dog, and even with more aggravated cruelty; yet the dog seemed no way offended by the wounds, but howling a little when he received them, continued alert and well after them, and soon after was set at liberty, without shewing the smallest symptoms of pain. The experiment was repeated with fresh scorpions upon seven other dogs, and three hens, but not the smallest deadly symptom was seen to ensue. He put three scorpions and a mouse into the same vessel, and they soon stung the little animal in different places. The mouse thus assaulted, stood for some time on the defensive, and at last killed them all one after another, and did not seem to have received any material injury itself, at least no fatal consequences followed, though it had received several severe wounds. From hence it appears, that many circumstances which are utterly unknown must contribute to give efficacy to the scorpion's venom. Whether the nature of its food, long fasting, the season, age of the insect, or the part of the body which it wounds, add to or diminish the malignity of the poison, still remains to be ascertained. The insects employed by Maupertius were newly caught, seemingly vigorous, and were of different sexes. The result of these experiments may serve to shew, that many of the boasted antidotes which are given for the cure of the scorpion's sting, owe their success more to accident than to their own efficacy. The scorpions of tropical climates are very large, and perhaps more venomous. Helbigius, who resided long in the east, says that he was often stung by the scorpion, and never suffered any material injury from the wound, though a painful tumor generally ensued, which was cured by rubbing with a piece of iron or stone, as he had seen the Indians do, until the part became insensible. Seba, Moore, and Bosman, give a very different account of the scorpion's malignity; and assert that without the speedy application of proper remedies, the wound proves fatal. Several fabulous anecdotes have been recorded of these animals by the older writers on natural history, which are totally unworthy of notice. The most remarkable of these is, that scorpions sometimes commit suicide, when they find themselves in a situation from which they cannot make their escape. It is said that a newly caught scorpion, placed in a circle formed with pieces of burning charcoal, runs round endeavouring to effect its escape, but finding no exit, it applies its tail to the back part of its head, and flings itself to death. Scorpions are viviparous, and produce about forty or fifty young ones at a time, which are completely shaped, and undergo no further change, except casting their skin from time to time like spiders. They feed on flies, spiders, worms, &c. and even on one another.

The

- australic.* The comb-like excrescences placed between the breast and abdomen, composed of six teeth; claws smooth. 7. A native of the South sea islands.
- maurus.* Comb composed of eight teeth; claws nearly heart-shaped and pointed, 1. A native of Africa.
- carpathicus.* Combs composed of six teeth; claws nearly heart-shaped and smooth. 2. It is found on the Carpathian mountains, and in Switzerland.
- aser.* Combs furnished with thirteen teeth; claws nearly heart-shaped and hairy. 3. A native of India and Persia; and is the largest and most formidable species.
- americana-nus.* Combs furnished with fourteen teeth; the claws fringed with hair; toes filiform. 4. A native of South America. It is eaten by the natives of California.
- chilensis.* Combs furnished with sixteen teeth; claws somewhat angular. This is a variety of the former.
- europæus.* Combs furnished with eighteen teeth; claws angular. 5. A native of the south of Europe and north of Asia. It is viviparous.
- botentotus.* Combs furnished with twenty-two teeth; claws smooth; the tail rough. 8. A native of Africa, in the neighbourhood of Sierra Leone. Body of a dark brown colour, and marked with raised lines; legs pale.
- australis.* Combs furnished with thirty-two teeth; claws smooth. 6. A native of Africa.

These are all the species of the scorpion that have been described in the last edition of the System of Nature.

116. CANCER, Crab.

Legs eight, (seldom six or ten), likewise two claws. Feelers six, unequal. Eyes two, placed at a distance from one another, and set on moveable stalks in most species. Mandible composed of a horny substance, and thick. The lip triple. The tail jointed and without a sting.

These live chiefly in water; and feed on insects, worms, dead fish, and dead bodies of any kind. They every year cast their shell, which is performed with much difficulty and pain; and during the change they become weak and sickly.

A. Antennæ four.

† The last articulation bifid; the Tail short.

‡ The Thorax smooth,

|| And entire on the sides.

- cursor.* The posterior parts of the sides of the thorax furnished with sharp points; the tail bent back. 1. A native of the Mediterranean and Indian seas. About sunset it leaves the water, and runs about the sands with great velocity.
- pennophyllax.* Thorax orbicular, unequal and fringed; four dorsal legs. 5. A native of America, within the shell of the *chama lazarus*, to which it gives notice of the approach of the cuttle-fish.
- * *pisum.* Thorax orbicular, obtuse; the tail of the same length with the body. 6. A native of the Mediterranean seas. About the size of a pea; the tail very obtuse; the legs smooth and without spines; claws somewhat oblong; toes equal.

Thorax nearly square; edge somewhat sharp; the legs* *minutus*-compressed. 8. It is found in the open sea, particularly on the *fucus natans*, and runs about on the surface of the water.

Very smooth; the anterior part of the thorax flat-*pinnothe*-tened on the sides; the tail is carinated and knobbed *res.* in the middle. 9. A native of the Asiatic seas. It resides within the shell of the *pinna*. The ancients supposed that this was a friendly connection formed for mutual defence: that the *pinna* being destitute of eyes, and thus exposed, when he opened his shell, to the attacks of the cuttle-fish and other enemies, was warned of their approach by his little lodger, on which he immediately shut his shell, and both were safe.

Land crab. The first joint of the legs prickly; the *fe-ruricola*. cond and third joints set with tufts of hair. 11. A native of South America. This species resides in the woods. In the Bahama islands they are so numerous that the ground seems to move as they crawl about. At breeding time they generally make to the sea shores, for the purpose of washing off their spawn, and depositing it in the sand, and no obstruction will make them turn aside from the straight road, when they are on their progress towards the sea. They are esteemed very excellent food. They feed on vegetables, but when they have fed on the manchineel apple, they are reckoned poisonous. When taken, they will seize the person's finger with their claw, and endeavour to escape, leaving the claw behind, which for the space of a minute after it has been separated from the body, continues to squeeze the finger closely. They vary in size and colour; the light-coloured ones being esteemed the best food.

||| Thorax marked along the sides with incisions.

Thorax marked with one small projection, one of the *vocans*. claws larger than the other; the eyes long. 14. A native of Jamaica. It conceals itself under stones, and utters a cry when caught, and pinches severely.

The thorax furnished with two projections on each side; claws very long. 110. A native of England. *angulatus.* Found in the sea near Weymouth. The claws are three times the length of the body.

Hairy; thorax notched on both sides; the hind-legs *dromia*. terminating in two nails. 24. A native of the Indian seas. Black; the extremities of the claws smooth and white. It is reckoned poisonous.

Common Crab. Thorax marked on each side with *pagurus*. nine obtuse folds; the tips of the claws black. 27. A native of both the European and Indian seas. This is the crab most generally used in this country for the table; they are in season and heaviest in the summer; and cast their shells in the winter and spring. They frequent rocky shores.

‡‡ Thorax hairy or prickly on the upper side.

Thorax hairy, marked with knobs and oval; furnished with a beak which is divided at the extremity; claws oval. 30. A native of the European seas. This species is supposed to be injurious to oysterbeds; on this account the fishermen, when they meet with them in the course of dredging, are careful not to return them into the water, but carry them on shore, and destroy them.

Thorax

maja.

Thorax prickly; claws turgid and covered with spines; the fingers of the claws covered with tufts of hairs; legs six. 41. A native of the Norwegian seas.

** horridus.*

The thorax set with spines, and covered with knobs; claws oval; tail carious. 43. A native of the Asiatic and Norwegian seas. There is a large variety of this found on the east coast of Scotland, which has its legs and claws covered with spines.

§ § *Antennæ set on stalks; the last articulation of the posterior pair bifid; Tail long and without leaves.*
Paguri Fabricii. Parasitici.

latro.

Thorax divided into four; the tail simple and big-bellied beneath. 56. A native of East India. In holes of rocks. Wanders about on land by night in search of cocoa-nuts, on which it feeds. To procure them it mounts the trees, and having detached the nuts, and let them drop to the ground, it descends and tears them open with its claws. This species is eatable, except the intestines.

bernhardus.

Claws heart-shaped, and covered with sharp points; the claw on the right side larger than the other. 57. A native of the European seas. This species being destitute of shell towards the tail, takes possession of the empty shells of different species of cochlea, changing from one to another as it increases in size; the tail, which is soft and without a shell, is furnished with a hook to secure itself in its habitation.

diogenes.

Claws smooth and downy; the claw on the left side larger than the other. 53. A native of the American and Asiatic seas. It occupies the empty shells of different species of cochlea.

caput mortuum.

Downy, covered with a hemispherical cap. A native of the Mediterranean sea. It is of a dirty gray colour; hemispherical and without spines. It very much resembles a scull or death's head, whence it has received its name; it is about the size of a chestnut. The cap proceeds, as it were, from the hind-legs, and is turned over the body; the fingers of the claws equal and naked at the tips; the extremity of the legs sharp.

** araneiformis.*

Claws rough; the tail callous at the extremity, and furnished with a hook. 143. It is found in the fissures of the rocks on the sea-shore near Edinburgh. It occupies the empty shells of the *nerita* or *turbo*.

** rugosus.*

Thorax wrinkled, ciliated, and prickly on the fore part; the beak furnished with three small projections, the claws filiform. 149. A native of the Mediterranean and north seas. It is found on the sea-shore near Banff in Scotland. This is the *C. banffius* of Pennant, and the *C. brachiatus* of Shaw.

§ § § *Antennæ set on stalks, the posterior pair cleft; Tail long.*

‡ *The shell of the Thorax covering the Thorax completely.* Astaci. Lobsters.

|| *The posterior Antennæ bifid.*

** gammaeus.*

Lobster. Thorax smooth; the beak notched on the sides, marked on the upper side, at the base, with a double tooth. 62. It inhabits the sea, on rocky shores. This is reckoned the most delicate species; and is most

in request for the table. They chiefly frequent deep clear water. They are taken in wicker-baskets, with holes on the sides, which allow the lobsters to enter, and prevent their egress; or with small nets attached to iron hoops. They breed in the summer months, and deposit many thousands of eggs in the sand. They cast their shell annually, and when any of their legs or claws happen to be torn off they grow again. They are in season from October to May. Lobsters are said to be very much alarmed at thunder, so much so as sometimes to cast their claws.

Craw-fish. Thorax smooth, the beak notched on the sides, with a single tooth on each side at the base. 63. It inhabits fresh waters; it lodges in holes in the clayey banks of rivers or lakes. It is reckoned a delicacy, and is much in request as food.

Antennæ projecting; beak tapering towards the extremity; eyes globular and prominent. 156. A native of the north seas. This little animal is very abundant, and is the principal food of the herrings and cod-fish.

||| *The posterior Antennæ divided into three.*

Prawn. Thorax smooth; the beak ferrated above, beneath furnished with three small projections; the edge of the thorax furnished with five small projections. 66. A native of the European seas. The beak is sometimes straight, sometimes crooked. There is a smaller variety of this, called in London the *white shrimp*, which is white when boiled. Prawns are much relished by most people; and are very abundant in sandy shores.

Shrimp. Thorax smooth; beak short and entire; the moveable toe of the claw longer than the other. 67. A native of the northern seas. This species is reckoned the most delicious of the genus. It is very plentiful on the sandy shores of Britain.

‡ ‡ *The shell of the Thorax not covering the Thorax completely.* Squillæ Fabricii.

Claws furnished with a single fang, crooked, compressed, and notched; without a moveable toe. 76. A native of the Mediterranean and Asiatic seas. It is reckoned a delicacy by the Italians.

||| | *Antennæ set on stalks, and simple.* Gammari Fabricii.

Claws consisting of a single fang; legs fourteen; *ampulla* the thighs of the hind-legs compressed and dilated. 170. A native of the north seas. Large, almost white; the beak short, curved, and sharp; the tail composed of six leaves or plates; the last articulation bifid.

Claws four, furnished with a single fang, and destitute of a moveable toe; legs ten. 81. A native of Europe. It is frequent on the sea-shore, in wells, ditches, rivulets, and likewise in the salt lakes of Siberia; it swims on its back, and leaps. It is injurious to fishermen by eating their nets, and also hurtful to fishes, by exciting ulcers on their gills. It shines in the dark.

B. *Antennæ two.*

|| *Two arched Scales in place of the posterior Antennæ.*
Scyllari Fabricii.

* *arctus.* The scales of the antennæ fringed with prickles. 75.
A native of almost every sea.

||| *Scales none; Antennæ fringed with thickly-set hairs.*
Hippæ Fabricii.

cæcbarus. Thorax wrinkled and oval; claws compressed and prickly along the edges. 72. A native of South America and India.

181 species of this genus have been described by Gmelin, in the last edition of the System of Nature.

117. MONOCULUS.

Legs formed for swimming; very long; from four to eight. Body covered with a shell, composed of from five to ten segments, growing smaller towards the tail. Antennæ two; those of the male thicker and shorter than those of the female. In some species they are wanting. Sometimes one eye, more frequently two, approaching very near to one another. Feelers four, constantly in motion while the animal is swimming; the posterior pair are very small, and bent like hooks.

The insects of this genus live in water; some of them are found in the sea, others in rivers, but most of them in stagnant waters; they have been called *monoculi* from the circumstance of some of them having but one eye, or two eyes placed so close together as to appear but one. Some of them are viviparous, some oviparous.

A. *Those which have one Eye.*

§ *Body covered with a hard Crust.*

‡ *Antennæ none.* Polyphemus Mulleri.

oculus. Feelers two, long and divided; tail inflected. 10. A native of Europe. To be found in lakes and marshes from May to September. It swims on its back, frequently in large swarms; eye very black, occupying almost the whole of its head.

‡‡ *Antennæ two or four.* Cyclopes Mulleri.

§ *Antennæ four.*

* *quadri-*
cornis. Tail straight, and divided at the extremity. 6. A native of Europe; in fresh waters. Body grayish or greenish, smooth or covered with hair; legs eight and hairy. Female with an oval bag on each side of the tail, which contain the eggs. The antennæ in the male are much thicker and shorter than in the female; the tail is composed of four articulations; in the female it is furnished with two small spines. When viewed in the microscope they are found to have two eyes placed very close together. They are very frequent even in the purest water, and are often swallowed along with it.

‡‡ *Antennæ two.*

§ *Antennæ linear.*

* *rubens.* Reddish; tail straight and forked. 13. A native of

Europe; in marshes, lakes, and rivulets: it is to be met with throughout the whole year. The antennæ as long as the body; legs eight.

||| *Antennæ nearly clavated.*

Antennæ stiff; tail bifid. 18. Inhabits, though *claviger*, rarely, the rivers of Germany; and glides slowly along, alternately on its back, belly, and sides; and sometimes raises itself upright. Upper part of the body white, beneath red; legs eight; tail very small and without articulations.

§ § § *Antennæ dilated.*

Antennæ short; tail furnished with two sharp points. 19. A native of Europe; in marshes. It is very rare. *crassicornis.* Body composed of five segments; the antennæ swelling from the base to the middle, and becoming sharp towards the extremity.

§ § § § *The tip of the Antennæ terminating in three points.*

Antennæ very small and straight; body without articulations; claws smooth; tail furnished with two bristles. 20. Inhabits salt water.

§ § § § § *Antennæ bent backwards.*

Antennæ short; body without articulations, furnished with claws; tail furnished with two bristles. 21. Inhabits salt water.

§ § § § § § *Antennæ of the (male) furnished with little hooks.*

The bristles of the tail very short. 22. Inhabits *brevicornis* salt marshes. It very much resembles the *M. quadricornis*; the top of the antennæ in the female larger, and forked at the extremity.

‡‡ *Those which have a bivalved Shell.*

‡ *Head exposed; two-branched Antennæ; Legs from eight to twelve.* Daphniæ Mulleri.

§ *Tail bent inwards.*

The posterior part of the shell set with sharp points. * *pulex.* 4. It is found everywhere in stagnant waters, and in great abundance. It is a frequent cause of the water assuming the colour of blood. The shell is yellowish; the abdomen, intestines, and ten legs red. The female is three times the size of the male; and produces from eight to twelve green eggs; the back is marked with a large square spot resembling a saddle.

§ § *Tail bent downwards.*

The shell without prickles; the head furnished with *crystallinus.* two short projecting horns. 29. A native of the north of Europe; in lakes and rivers. White and oblong; very transparent; viviparous, and furnished with twelve hairy feet.

§ § § *Tail bent backwards.*

Tail bent backwards. 5. A native of Europe; in *pediculus.* fresh water.

§ § § §.

§ § § Tail straight.

setifer.

The anterior angles of the shell furnished with a tuft of bristles. 30. A native of Europe; in stagnant waters; transparent, of an oblong oval form; antennæ divided into three, furnished with eight or more hairy legs; the extremity of the tail terminating in two hooks.

†† Head concealed; Antennæ two and hairy; Legs eight. Cytheræ Mulleri.

viridis.

Shell kidney-shaped and downy, 31. A native of Europe; found on various species of *fucus* and *conserua*; the extremity of the antennæ terminating in three points; the fore-legs formed like hooks.

|||| Head concealed; Antennæ two, like hairs; Legs four. Cyprides Mulleri.

**conchaceus.*

Shell oval and downy. 7. Found in clear stagnant waters; the antennæ white or yellowish, and stretched out; swims very swiftly, with ten bristles. It is green, opaque; feet yellowish; abdomen nearly bilobed and orange-coloured, marked in the middle with a black circle. It conceals itself within its shell, and swims on its belly. It resembles a muscle in miniature, is very minute, and seldom exceeds the tenth part of an inch.

††† Those with shells consisting of one valve.

† Legs four; Antennæ two. Amymonæ Mulleri.

**satyrus.*

Shell oval; antennæ obtuse, and extended in a vertical direction. 46. It is frequent in clear fresh water; it is agitated at intervals with a tremulous motion; the shell is flat and membranaceous; antennæ rigid, furnished with three very short bristles at the extremity; the fore-legs thick and bifid; tail terminating abruptly, eight-cleft in the middle. The insect is transparent.

|||| Legs six; Antennæ two. Nauplii Mulleri.

bracteatus

Shell orbicular, and without spines or bristles. 52. It is rare; found in clear fresh water; the shell very transparent; the antennæ resembling legs; the legs terminating in three bristles; the eye not conspicuous.

B. Eyes two. Binoculi.

† Those with shells composed of one valve.

§ Eyes two placed beneath; Antennæ two; Legs four to eight. Arguli Mulleri.

**delphinus*

Legs eight. 55. Found in rivers.

§ § Eyes situated on the back; Antennæ two or six; Legs varying in number. Limuli Mulleri.

*polyphe-
mus.*

Shell orbicular; future in the middle of the form of a crescent; tail triangular, long and tapering. 1. A native of the Indian seas, particularly in the neighbourhood of the Molucca islands. It is likewise found on the shores of Carolina. It is the largest of all known insects; sometimes it grows to the length of four feet. It is frequently found in pairs, male and female. It is

very rarely found among petrifications. There are seven spines on the anterior part of the back of the shell: legs 14.

Shell oblong; the future before of the form of a * *apus*. crescent; tail composed of two bristles. 3. A native of Europe; in ditches, ponds, &c.; and though dried in summer, when the water has evaporated, yet they revive when the water returns. This is the largest species to be found in Britain.

§ § § Eyes placed on the sides; Antennæ two, setaceous; Legs eight or ten. Caligi Mulleri.

Body short; tail bifid, and composed of one thin flap. * *piscinus*.

2. A native of the European seas. Found on flounders, cod-fish, salmon, &c. adhering on the outside between the scales; running swiftly both on the fish and on the water.

†† Those with Shells composed of two valves; Head not enclosed within the shell; the Eyes placed on the sides; Antennæ two or four, resembling hairs, and placed beneath; Legs eight and more. Lynceæ Mulleri.

Tail inflected; shell globular. 60. A native of Europe. It is found about the edges of stagnant waters, and among duck-weed. It is very minute; the shell is reddish; antennæ two; legs twelve; tail furnished with a small hook at the extremity and concave beneath; the ovaria green. * *sphaeriscus*.

66 species of this genus have been described by Gmelin in the last edition of the System of Nature.

118. ONISCUS.

Jaw terminating abruptly, and furnished with small teeth. Lip bifid. Feelers unequal, the posterior ones being longer than the others. Antennæ setaceous. Body oval. Legs fourteen.

The species of this genus feed on the leaves of plants, on filth, and on the juices of animals; some of them are very injurious to the fruit of wall-trees; they undergo no other change but a change of skin. They are found under stones, in old walls, houses, and woods; some species live in water.

Abdomen covered with two thin plates; the tail semi-oval. 1. A native of the European seas. Viviparous; and is very injurious to fishes. * *asellus*.

Antennæ four; tail long and sharp. 5. Inhabits the sea. It swims very quickly. It lives on crabs and fishes; the fishermen dislike it very much. * *entomon*.

Oval, and of a brownish ash-colour; tail obtuse and entire. 15. A native of Europe; under stones. When touched it rolls itself up into a hard motionless ball; from which circumstance it has received the name of armadillo. * *armadillo*.

Oval; tail obtuse, furnished with two simple appendages. 14. A native of Europe; in houses, walls, woods, &c. The young are contained in a follicle of four valves on the abdomen of the mother. This species was formerly used in medicine. * *asellus*.

38 species of this genus have been described in the last edition of the System of Nature.

119. SCOLOPENDRA.

Antennæ setaceous. Feelers two, filiform; articulated and connected within the jaws. Lip divided and marked with small projections. Body flattish. Legs very numerous; one on each side of each of the segments of the body.

These insects live in decayed wood, about houses, under stones, and some of them in fresh water. They feed on other insects in every stage of their existence. The larvæ differ but little from the perfect insect, except that they have fewer feet. The pupæ likewise are active, and very much resemble the perfect insect. All the European species are small, but in tropical countries they are to be seen a foot long and an inch and a half in circumference.

* *lagura*. Twelve legs on each side; body oval; tail furnished with a white tuft of hairs. 1. A native of Europe; in mossy ground.

* *forficata*. Legs fifteen on each side. 3. A native of Europe and America. Very frequent under stones.

gigantea. Legs seventeen on each side. 4. A native of America.

morfitans. Legs twenty on each side; eyes eight. 5. A native of America and India. Body composed of 22 segments; the antennæ consisting of 20 articulations. It is much dreaded on account of its bite, which is said to be poisonous.

* *electrica*. Legs 70 on each side; body linear. 8. A native of Europe; in close damp places, and shines in the dark.

phosphorea. Legs 76 on each side. 9. A native of Asia. It shines in the dark like the *lampyris*; it is said that this insect has dropt from the air into a ship 100 miles from land, in the Indian and Æthiopian seas. Head oval, yellowish, and marked with two grooved lines, and a third transverse line; body filiform, and is about the

thickness of a goose-quill, marked with two parallel yellow lines; antennæ tapering, of a rusty colour, and consisting of 14 articulations.

12 species of this genus have been described in the last edition of the System of Nature.

120. JULUS.

Antennæ moniliform. Feelers two, filiform and jointed. Body semicylindrical. Legs very numerous, two on each side of every segment of the body.

The insects of this genus feed on other insects, particularly *acar*i. The larva and pupa have many feet, are active, and resemble the perfect insect.

Legs 20 on each side. 1. A native of the European seas.

Legs 134 on each side. 9. A native of America. *maximus*. This is the largest species of the genus. It bites severely, but is not poisonous.

Legs 120 on each side. 5. A native of Europe; **fabulosus*. in sandy places, and on the hazel.

12 species of this genus have been described in the last edition of the System of Nature.

The following table exhibits the number of species included under each order.

COLEOPTERA	4087
HEMIPTERA	1427
LEPIDOPTERA	2570
NEUROPTERA	174
HYMENOPTERA	1265
DIPTERA	692
APTERA	679

In all 10,894

GENERAL OBSERVATIONS.

THOUGH the definition of an insect which we have already given from Linnæus be perfectly correct, (viz. a small animal breathing through pores on its sides, furnished with many feet and moveable antennæ, covered with either a hard crust, or a hairy skin), it may not be improper to mention, more at large, those circumstances which form the line of distinction between insects and other animals.

1. Insects are not furnished with red blood, but instead of it their vessels contain a transparent lymph. This may serve to distinguish them from the superior animals, but it is common to them with many of the inferior; though Cuvier has lately demonstrated the existence of a kind of red blood in some of the *vermes*.

2. They are destitute of internal bones, but in place of them are furnished with a hard external covering to which the muscles are attached, which serves them both for skin and bones; they are likewise without a spine formed of vertebræ, which is found in all the superior classes of animals.

3. They are furnished with articulated legs, six or more; this circumstance distinguishes them from all other animals destitute of a spine formed of vertebræ.

4. A very great number of insects undergo a metamorphosis; this takes place in all the winged insects.

5. They frequently change their skin in the progress of their growth.

6. A very great number of insects are furnished with jaws placed transversely.

7. The wings, with which a very great number of insects are furnished, distinguish them from all other animals which are not furnished with a spine composed of vertebræ.

8. Insects are oviparous; scorpions and aphides during the summer months are viviparous.

9. Insects have no nostrils.

10. Insects are destitute of voice.

11. They are not furnished with a distinct heart composed of ventricle and auricle.

12. Incubation is not necessary for hatching their eggs.

The Organization of Insects.

WHEN we wish to become thoroughly acquainted with natural objects, we must not confine ourselves to an examination of their external appearance and configuration,

General
Observations.

General
Observations.

guration, but ought to examine their internal structure and their component parts; and extend our inquiries to every thing which relates to them. Insects, like all other organized bodies which form the animal and vegetable kingdoms, are composed of fluids and solids.

In the four superior classes of animals. viz. quadrupeds, birds, reptiles, and fishes, the bones form the most solid part, and occupy the interior part both of the trunk and limbs; they are surrounded with muscles, ligaments, cellular membrane, and skin. The matter is entirely reversed in the class of insects; the exterior part is most solid, serving at the same time both for skin and bones; it encloses the muscles and internal organs, gives firmness to the whole body, and by means of its articulations, the limbs, and different parts of the body, perform their various motions. In many insects, such as the crab, lobster, &c. the external covering is very hard, and destitute of organization; it is composed of a calcareous phosphate, mixed with a small quantity of gelatine, formed by an exudation from the surface of the body. As its great hardness would check the growth of the animal, nature has provided a remedy; all of these crustaceous insects cast their shell annually. The skin of most of the other insects, though composed likewise of calcareous phosphate, is softer and organized, being formed of a number of thin membranes adhering closely to one another, and putting on the appearance of horn. It owes its greater softness to a larger proportion of gelatine. The muscles of insects consist of fibres formed of fasciculi; there are commonly but two muscles to produce motion in any of their limbs, the one an extensor, the other a flexor. These muscles are commonly attached to a tendon composed of a horny substance, connected to the part which they are destined to put in motion. The articulations of insects are formed in a variety of ways; Cuvier, in his Comparative Anatomy, tom. i. page 445, has given a very minute account of them. Though Linnæus, and several others following him, have asserted that insects have no brain, yet it is certain that at least a number of the larger kind, as the lobster, crab, &c. have a soft substance similar to brain, from which the optic and other nerves take their rise; besides, when this substance is irritated, the animal is thrown into convulsions; hence we would conclude, that insects have a brain as well as the animals of the four superior classes, though it be smaller in proportion to their body.

In most insects the brain is situated a little above the œsophagus; it divides into two large branches which surround the œsophagus, and unite again under it, from which junction a whitish nervous cord proceeds, corresponding to the spinal marrow of the superior animals, which extends the whole length of the body, forming in its course twelve or thirteen knots or ganglions, from each of which small nerves proceed to different parts of the body. Those who deny that insects have no brain, lay much stress on this circumstance, that many insects are capable of running about after they have been deprived of their heads; the *hippoboscæ* in particular, is frequently instanced, which moves about quite readily, and is even said to copulate after its head has been cut off. The ganglions which are formed in the course of the larger nerves, perform in a great measure the function of the brain, indeed each of these ganglions may be viewed as a subordinate brain; in this way it may be

easily conceived how the various parts which derive their nerves from any one of these ganglions, may be enabled to perform their different functions, after they have been separated from the other parts of the body, and deprived of all connexion with the brain.

Whether insects be endowed with any senses different from those of the superior animals, cannot easily be ascertained, because we are only acquainted with the five which we ourselves enjoy. It appears pretty evident that they possess vision, hearing, smell, and touch; as to the sense of taste we are left to conjecture, for we are acquainted with no facts, by which we can prove that insects enjoy the sense of taste, nor do we know of any by which we can prove that they do not.

The eyes of insects are of two kinds; the one compound, composed of a number of lenses, large, and only two in number; the other are small, smooth, and vary in number from two to eight. The small lenses which form the compound eyes are very numerous; they amount in some insects to many hundreds. Leeuwenhoek has counted 800 of them in the eye of a fly. Pugett says he observed upwards of 17,000 in the eye of a butterfly. The eyes of insects are without eyelids, and are covered externally with a hard smooth substance. Cuvier has given the anatomy of the eye of a dragon-fly. The internal surface of the lenses is covered with a black varnish. Under each of the lenses of which the eye is composed, there is a small nervous fibre, attached to the edge of the black covering which lines the internal surface of each lens by one extremity, and by the other to a membrane which is of the same extent with the cornea, which Cuvier calls the *choroide*. It is easily detached from the small nervous fibre, and appears to the naked eye, finely radiated with black and white; behind this there is still another membrane composed entirely of medullary substance, which is connected on each side with the hemisphere of the brain.

Whether insects from the compound nature of their eyes see objects multiplied, or enjoy only single vision, cannot be ascertained; were objects to be seen multiplied in proportion to the vast number of lenses of which the eyes of insects are composed, vision would certainly be very confused, and were we to be guided by analogy; we might naturally enough suppose that insects saw objects single with their compound eyes, as we ourselves see objects single with two eyes.

The eyes of insects, according to Swammerdam, do not contain the same humours which are found in the eyes of animals which compose the superior classes. The external membrane which covers the eyes, varies in colour in different insects; in many of the dipterous insects, particularly the gad-fly, it is agreeably variegated.

The far greater number of insects have only two eyes, like the animals of the superior classes; some have three, e. gr. the *scolopendra*; some four, e. gr. *gyrinus*; some six, e. gr. *scorpions*; some eight, e. gr. *spiders*.

The eyes of insects are commonly immoveable; crabs, however, have the power of moving their eyes.

That insects are endowed with the sense of hearing can no longer be disputed, since *frog-hoppers*, *crickets*, &c. furnish us with undeniable proofs of the fact. Nature has provided the males of these insects with the means of calling their females, by an instrument fitted to produce a sound, which is heard by the latter. The male

male

General
Observations.

male and female *death-watch* give notice of each others presence, by repeatedly striking with their mandibles against old wood in houses, or decayed trees, their favourite haunts. Their ears have been discovered to be placed at the root of their antennæ, and can be distinctly seen in some of the larger kinds, as the lobster.

That insects enjoy the faculty of smelling, is very evident. It is the most perfect of all their senses. Beetles of various sorts, *mitidule*, the different species of *dermestes*, *sylyphs*, *flies*, &c. perceive at a very considerable distance, the smell of ordure and dead bodies, and resort in swarms to the situations in which they occur, either for the purpose of procuring food or laying their eggs. The common blue flesh-fly, is attracted by the strong smell of the *arum dracuntium*, which very much resembles that of carrion, and deposits its eggs on it: these flies are likewise deceived, and deposit their eggs on the flowers of the *stapelia hirsuta*, which has a very cadaverous smell. But, though we can thus easily prove the sense of smell among insects, it is difficult to discover the seat of that particular sense. Several naturalists have supposed that it resides in the antennæ. Dumeril, in a dissertation published in 1799, attempts to prove, that it must be situated about the entrance of the spiracula or respiratory organs, as Baister had previously supposed. Notwithstanding his arguments, Latreille is still disposed to follow the opinion of those who believe the antennæ to be the organs of smell. His reasons for favouring this opinion are:

1. Smell is produced by the action of air, impregnated with odoriferous particles, on the nervous or olfactory membrane, which transmits the sensation.

If insects be endowed with an organ, furnished with similar nerves, capable of receiving impressions from air charged with odoriferous particles, such organ may be regarded as that of smell. Should the antennæ present a tissue of many nerves, what inconvenience can result from supposing that this tissue is capable of transmitting odour? Would not this hypothesis, on the contrary, be more simple, and more consonant to anatomical principles, than that which fixes the seat of smell at the entrance of the spiracula?

2. Many male insects have their antennæ more developed than the females; a fact easily explained, if we admit that these organs are the seat of smell.

3. It is certain that most of those insects which live or deposit their eggs on putrid animal or vegetable matters, stagnant waters, &c. are almost uniformly distinguished by a greater development of the antennæ; such, for example, as the beetle, *sylyphs*, leather-eaters, *tipulæ*, &c. These required a more perfect sense of smell, and are organized accordingly.

4. A great many insects, which are entirely rapacious, have simple antennæ; and those which are characterized by similar manners, and which are sedentary, have none at all; as for instance some of the spiders.

5. Insects discover their habitations and food by the sense of smell. Latreille deprived several insects of their antennæ, and found they instantly fell into a state of stupor or derangement, and seemed to be incapable of recognizing their haunts or their food, though placed close by them. Such experiments deserve to be prosecuted. With this view, were the antennæ of dung-beetles to be coated with varnish, and the animals placed near excrement, (their usual food),

a decisive proof would be obtained; for were they readily to find their way to the excrement, it may be fairly inferred that the antennæ were not the organs of smell. Should the reverse take place, an opposite conclusion might naturally be drawn.

6. Nerves terminate the antennæ, the articulations of which, though externally covered with a pretty thick membrane, are hollow, lined within with a soft substance, which is often of a watery consistence, the extremities of which, when exposed to the air, may receive impressions from it.

Some have imagined the antennæ to be the organs of touch; but Latreille contends that such an opinion is by no means supported by facts, and alleges that the shortness of the antennæ in most species, and the way in which most insects carry their antennæ, seem to prove the contrary. He thinks their antennæ ill adapted to become the organs of touch, because they have a hard and scaly covering. He is rather inclined to believe that the sense of touch, at least in certain species, is situated in the paws or extremities of the fore legs. The palpi or feelers in spiders and some other insects, seem to possess the sense of touch in an eminent degree; but many are disposed to consider these palpi rather as the organs of taste. Though we have no direct proof that insects enjoy the sense of taste, yet we may naturally enough suppose that they do, both from analogy, and from the circumstance that most insects prefer some particular kinds of food to all others; many of them will rather die of famine, than eat any other kind of food than that which is peculiar to them. The superior part of the oesophagus has been supposed by some to be the seat of the organ of taste.

Aliment of Insects.

INSECTS feed on a great variety of substances; there are few things either in the vegetable or animal kingdoms which are not consumed by one or other of them. The leaves, flowers, fruit, and even the ligneous parts of vegetables, afford nourishment to a very numerous class; animal bodies both dead and alive, even man himself, is preyed on by many of them; several species of the louse, of acarus, of the gnat, and the common flea, draw their nourishment from the surface of his body; the *gigur* or *chiegoe*, (*pulex ulcerans*), penetrates the cuticle, and even enters his flesh. A species of gad-fly (*æstrus hominis*) deposits its eggs under his skin, where the larvæ feed; the *phalena pinguinalis* frequently finds its way into his stomach, where it sometimes proves a fatal lodger. Other caterpillars insinuate themselves into different cavities of his body. All the inferior animals have their peculiar parasitical insects which feed on them during their life.

There are some insects which can feed only on one species. The caterpillars both of moths and butterflies, which feed on the leaves of some particular vegetable, would die without being able to taste any other. There are others which can make use of two or three kinds of vegetables, but which never attain full perfection, except when they are fed on one particular kind; for example, the common silk-worm, which eats readily all the species of mulberry, and even common lettuce, neither attains so great a size, nor produces so much silk, as when fed on the white mulberry. Although that species of coc-

General
Observations.

General
Observations.

cus which produces the lac, feeds on the *ficus religiosa*, *ficus indica*, *rhamnus jujuba*, and *plofa Horti Malabarici*; yet the lac collected from the *ficus religiosa*, is very much superior in quality. That species of coccus which produces the cochineal, if it will at all feed on any other species of vegetables, never affords a dye equal to that which is to be obtained from it when fed on that particular species of cactus called *coccinellifera* by Linnaeus. There are a great many which feed indiscriminately on a variety of vegetables, which from that circumstance receive the title of *polyphaga*. Almost all herbivorous insects eat a great deal, and very frequently; and most of them perish if deprived of food, for but a short time. Carnivorous insects can live a long while without food, e. g. the *carabus*, *dytiscus*, *cicindela*, spiders, &c. As many insects cannot transport themselves easily in quest of food, to places at a distance from one another, nature has furnished the perfect insects of many species with an instinct, which leads them to deposit their eggs in situations where the larvæ as soon as hatched, may find that kind of food which is best adapted to their nature.

Most of the butterflies, though they flutter about and collect the nectarious juice of a variety of flowers as food for themselves, always deposit their eggs on, or near to those vegetables destined by nature to become the food of their larvæ. The various species of *ichneumon* deposit their eggs on the bodies of those insects on which their larvæ feed. The *firex* (tailed wasp), and *sphex* are likewise careful to deposit their eggs in situations where their larvæ, when hatched, may find subsistence. The *ichneumon seductor*, after having killed an insect (most commonly a spider) deposits an egg on it, and then shuts it up in a cell which it forms of clay. The *sphex figulus* likewise deposits its eggs on the body of spiders which it has killed, and encloses it in a cell composed of clay. Some insects, at different periods of their existence, make use of aliment of very different properties: the larvæ of some are carnivorous, while the perfect insect feeds on the nectarious juice of flowers: e. g. *firex*, *ichneumon*, &c. The larvæ of most of the lepidopterous insects feed on the leaves and young shoots of vegetables, while the perfect insects either take no food at all, or subsist on the sweet juice which they extract from flowers: indeed the construction of their mouths prevents them from taking any other than fluid food.

The alimentary organs may be divided into four parts. 1. Those of Mastication; 2. Deglutition; 3. Digestion; and 4. Excretion. The organs of mastication vary considerably in different insects. Amongst those animals, some subsist on solid food; therefore must be furnished with tentacula (or pincers) for its comminution. Others subsist on liquid food, and are furnished with suckers, which vary in form in different insects. Sometimes with a trunk formed of a double sheath twisted in a spiral form, as is to be seen in the butterfly and the sphinx. Sometimes with a sharp stiff beak bent towards the breast; such as in the bug, the frog-hopper, and boat-fly. At other times with a fleshy proboscis ending in two moveable lips, or in a sucker composed of several syphons, inclosed in a sheath consisting of two valves, which is the case in the dipterous insects; such as the common fly, the horse fly, the gnat, &c.

Amongst insects which have jaws, some, such as

General
Observations.

those of the orders *Coleoptera* and *Aptera*, have these parts hard and composed of a horny substance, and subsist on matters of a considerable degree of tenacity. Those coleopterous insects which have six feelers feed on living insects; and those which have only four, feed on putrid animal or vegetable substances. The other insects furnished with jaws (such as many of the order *Hymenoptera*), have these parts soft and membranaceous, and consequently subsist on liquid or very succulent food.

There are no salivary glands to be met with in the mouths of insects, but a set of floating vessels secrete a fluid, varying in colour in different insects, very similar to saliva.

The organs of deglutition present nothing very remarkable. The oesophagus is a straight short tube, reaching from a little way under the brain to the first ganglion of the nerves, which perhaps may be considered as the cerebellum of insects. In the insects with ut jaws, deglutition is performed by a tube composed of annular muscular fibres. The trunk of the butterfly, the proboscis of the common fly, and the beak of hemipterous insects, may be considered as part of the oesophagus projecting beyond the mouth.

The organs of digestion consist of the stomach and intestinal canal. The stomach of insects varies very much according to the nature of the aliment on which they subsist. Sometimes it is single, frequently double, at other times manyfold. The greater number of insects have a single stomach, which is sometimes entirely membranaceous, sometimes muscular, and at other times it is merely the continuation of the oesophagus without any perceptible dilatation. Those insects which have a dilated membranaceous stomach, subsist commonly on the juices of vegetables; such as the bees, which suck the nectar of flowers, the butterflies &c. Their stomachs are almost always dilated, owing to the disengagement of gas from the substances they contain. Those which are furnished with a muscular stomach, such as the bug, the boat-fly, and almost all the hemipterous insects, feed on animal substances. Finally, those which have no dilatation in the oesophagus so as to form an evident stomach, commonly feed on the leaves and roots of vegetables, such as the cock-chaffer and all the beetles. The whole of the alimentary canal in these insects is very long, without any perceptible enlargement. The double stomach is to be found in those coleopterous insects which feed on other live insects, such as the *cicindela*, *carabus*, *attelabus*, &c. all of them are likewise distinguished by six palpræ. The first of their two stomachs is muscular, and is a sort of gizzard, the muscles of which are composed of slender fibres. The second is a long membranaceous canal, which appears villous when examined by the microscope; this villosity at first sight may appear singular, but a little attention to the manner in which nutrition goes on in insects, will suggest an explanation of this peculiarity. When we consider that circulation proceeds very slowly, and that the nutritive fluids must be nearly in a state of stagnation, digestion could not proceed without the assistance of absorbent tubes, which may take up these fluids. We may naturally enough suppose this villosity to be nothing else, but a number of absorbent vessels which take up the nutritive part of the circumambient fluid. Those insects which have many stomachs may be called ruminating, because they have

General
Observations.

have the power of causing the food to return from the stomach to be chewed over again; such as the grasshopper, cricket, &c.

The mole cricket has a long œsophagus terminating in a round membranaceous stomach, which may perhaps be compared to the first stomach of the ruminating animals of the class *Mammalia*; where the food is accumulated, to be thrown back into the mouth, again to undergo a farther mastication.

A short intestine proceeds from this into a second stomach much less than the former, but muscular and apparently thicker, and furnished with parts which resemble the grinders in the stomach of crabs. They are small laminæ, resembling saws, disposed in five longitudinal rows, each composed of from ten to twelve smaller laminæ, which perform a sort of peristaltic motion by means of the muscular action of the stomach; and it appears pretty evident that the action of those laminæ is exerted on the food contained in the stomach. The other two stomachs are very similar, and placed one opposite to the other at the opening of the intestine which corresponds to the duodenum of the superior animals; they are wrinkled and thicker than the first stomach, but not so thick as the second.

This apparatus is to imbibe some part of the fluid from the aliment.

In the grasshopper the stomachs are similarly arranged. The cricket has to the number of five small and slender stomachs; indeed the two first seem only to be simple dilatations of the œsophagus.

In the cock-roach there is only one stomach which is very large, and almost entirely membranaceous; at the extremity of which, there is a number of partial enlargements which may be considered as so many stomachs. The stomachs of the larvæ frequently differ from those of their perfect insects; viz. the alimentary canal of the caterpillar differs very much from that of the butterfly; and the intestinal canal of the grub differs widely from that of the beetle.

The œsophagus of the grub of the *scarabæus nasicornis* dilates suddenly, forming a cylindrical stomach which is furnished with three ranges of cœcum, which have their extremities simple and loose. The intestine proceeds in a straight line from the stomach; then having formed a doubling, becomes larger, and puts on the appearance of a colon, four times the length of the stomach; on which is to be perceived two tendinous lines. At the extremity of the colon there is a considerable dilatation; beyond which it becomes slender, and forms the rectum. The intestinal canal of the *scarabæus melolontha*, or cock-chaffer, is almost exactly similar; but nothing analogous to this structure is observable in the perfect insect. The intestines of the *scarabæus melolontha*, and *sc. nasicornis* are very long, very much contorted, and equal throughout their whole length.

The larva of the *hyarophilus* has a very evident stomach, and a very short intestine. In the perfect insect the intestine is long, without any visible enlargement or stomach, which may be accounted for, perhaps in this way; the larvæ subsist on animal food, while the perfect insects feed on vegetables. The examples we have just given are striking. It may be remarked, that whenever the larvæ and the perfect insect subsist on the same kind of food, the difference in structure is less remark-

able; only the intestinal canal is longer in the perfect insect.

General
Observations.

The anus or the posterior orifice of the intestinal canal, not only affords a passage for the excrement, but encloses the extremities of the parts of generation. There are neither kidneys, bladder of urine, pancreas, nor any of the conglomerated glands observable in animals of the superior classes, to be found in insects.

Instead of the liver, there is a number of small floating filaments which surround the intestinal canal for almost two thirds of its length. There is a great quantity of fat in many insects, particularly in those which spend a considerable portion of their lives in a torpid state. It is contained in loose membranes that fill up the intervals between the bronchiæ. This fat in caterpillars is very white, and both in taste and consistence very much resembles that of other animals. The quantity is so considerable in some insects as to equal one third of the bulk of the body. All the insects which undergo a metamorphosis, are abundantly supplied with this fat; without it, indeed they seem unable to go through their destined changes; for it has been observed, that those caterpillars which have been fed on by the larvæ of the various species of ichneumon, though they may survive the ravages of these parasitical insects till they are changed into pupæ, commonly die before they become perfect insects.

The Respiration of Insects.

RESPIRATION is the act of inhaling and exhaling the air into, and out of the lungs. Quadrupeds, birds, and most of the amphibia, breathe through the mouth and nostrils. The air when received into the lungs is mixed with the blood, and imparts to it something necessary, and carries off something noxious.

Some authors have asserted that insects have no lungs. But late experiments and observations show, that no species wants them, or at least something similar to them; and in many insects they are larger in proportion to their bodies than in other animals. In most of them they lie at or near to the surface of the body, and send out lateral pores or tracheæ. The respiration of insects has attracted the attention of many naturalists, particularly, Swammerdam, Malpighi, Reaumur, Lyonnet, Muffchenbroeck, Degeer, Bonnet, Vauquelin, &c.

From their observations it may be inferred,

1. That insects do not breathe through the mouth or nostrils.
2. That there are a number of vessels for the reception of air placed along on each side of the body, which are commonly called *spiracula*, which are subdivided into a number of smaller vessels or bronchiæ.
3. That the vessels or tracheæ which proceed from the pores on the sides, are not composed of a simple membrane, but are tubes formed of circular rugæ.
4. That the spiracula are distinguishable, and are covered with a small scaly plate, with an opening in the middle like a button hole, which is furnished with membranes, or threads, to prevent the admission of extraneous bodies.

Reaumur is of opinion that the air enters by the spiracula into the tracheæ and bronchiæ; and is expired through small pores on the skin, without returning by the same way through which it entered. Were this

this

this the case, the respiration of insects would differ from that of other animals. Degeer seems to entertain the same opinion with Reaumur, from the account he has given of the manner in which caterpillars breathe; but thinks that inspiration and expiration through the spiracula and bronchia take place in the pupa. Lyonnet is not of the same opinion with Degeer, on account of an experiment made on the pupa of the sphinx. He supposes that this pupa lives for a certain time without respiration, and that the two anterior spiracula, which are the largest, and enclose the posterior ones, only serve the purpose of allowing the superabundant moisture to exhale, and to permit the external air to enter in its stead. Some experiments of Musschenbroeck seem to confirm the opinion of Lyonnet with regard to the pupa.

Perhaps nature, with that foresight which is observable in all her works, has taken care to form the pupa so as to require but a small quantity of air, and may have included in its body every thing necessary to enable it to undergo the change of its condition. The pupa of most insects is certainly very torpid, and little capable of receiving external impressions. The experiments of Malpighi and Reaumur have established the fact that insects must respire. Oil applied to the spiracula causes these animals to fall into convulsions, induces a general or partial paralysis, or causes their death.

Vauquelin, the celebrated chemist, has made several experiments on the respiration of the green grasshopper. The male of this insect being put into six cubic inches of oxygen gas (the purity of which was ascertained), lived eighteen hours. The oxygen gas was changed into carbonic acid gas; it rendered lime water turbid, but did not extinguish a lighted candle; after the carbonic acid had been absorbed by means of fixed alkali, the combustion of the candle was more vivid than in common air. He found that the insect respired fifty or sixty times in a minute; but when put into oxygen, its respiration became about twelve times more frequent, being interrupted at last almost continually, because it was on the point of undergoing asphyxia. The air in which the insect had died, being washed with alkali, underwent a diminution of five per cent, and the vapour of ammonia could not again revive the insect.

A female insect being put into eighteen cubic inches of common air, lived thirty-six hours; its respiration was not altered as to frequency; the bulk of the air was not diminished at the death of the animal, but it extinguished a candle even after it had been washed in lime water; this is a new proof that oxygen is necessary to the life of insects; and when the atmospheric air contains but little of it, that insects would soon die.

This female grasshopper, being placed in sulphurated hydrogen gas, was seized with asphyxia instantly, and could be revived by no stimulus. These experiments not only prove that insects respire, and that oxygen is that part of the air which is necessary to their existence, but that carbonic acid or azote is fatal to them. The spiracula are neither of the same form, nor similarly situated in every insect; the larvæ of the common fly have several of these organs placed at the posterior extremity of their bodies; they are most frequently six.

Vol. VIII. Part I.

Circulation and Secretion of Insects.

ALL the animals of the two first classes have a double circulation; their hearts consist of two distinct auricles and ventricles. The heart in the amphibia has two distinct auricles without any communication; and under these there is the appearance of two ventricles similar in shape to those of the former class; but they may be considered as one cavity; for the ventricle sends out not only the pulmonary artery, but likewise the aorta; for there is a passage in the septum, by which the ventricles communicate freely, allowing the blood to pass from the left into the right one.

The heart of fishes has but one auricle and one ventricle, and one great artery which conveys the blood to the gills. The circulation in insects differs considerably from that of the superior animals. In the lobster, and others of the larger insects, when a piece of the shell is broken, the pulsation of the heart is seen distinctly, and that sometimes for several hours after it has been laid bare. A long delicate vessel runs along the back parallel to the intestines of many insects, particularly caterpillars, in which an alternate contraction and dilatation is perceptible. The heart, or principal artery which performs the function of the heart, seems to be composed of a great number of small hearts, connected together, which transmit the blood from one to another. But when this vessel is injected it becomes continuous, and the small hearts disappear. In the caterpillar the pulsation begins at the posterior part, and proceeds from one segment to another, till it arrive at the head. Reaumur has alleged, that the pulsation of this artery changes its direction in the pupa, and that the blood is propelled from the head towards the tail: he says this may be plainly observed in a pupa newly stripped.

Lyonnet denies the accuracy of Reaumur's observations; and says that he found a species of caterpillar, the pupa of which is very transparent, in which the longitudinal artery was to be seen very distinctly; having examined it carefully, a few days after its change, he ascertained that the motion of the artery had not at all changed its direction, and that it still continued to move from the tail towards the head as in the caterpillar. Further observations can alone determine which of these two opinions is the most correct. One anatomist has lately asserted that the dorsal canal observable in insects, serves the purpose of respiration. Cuvier has proved, that the conglomerate glands which are to be met with in all the animals that have a heart, do not exist in insects; but instead of them, that they are furnished with very long slender vessels which float in the internal cavities of the body, without being even connected into fasciculi; from this circumstance Cuvier is disposed to believe that insects have no heart. It is by means of these fine tubes that the different fluids are secreted, which are peculiar to various kinds of insects. Some insects discharge an acrid and fetid fluid, others discharge an oil of a very pleasant smell.

The bee, the wasp, the sphex, the crysis, have two vessels situated at the bottom of their sting, which contain a very acrid fluid, secreted from the mass of blood, which the animal discharges at pleasure through a perforation in the sting; it is this fluid which causes the

G g pain,

pain, inflammation, and swelling, which follow a wound inflicted by these insects.

In the scorpion, there is a fluid of a very malignant nature, which the animal discharges at pleasure through its sting; under certain circumstances, this fluid produces fatal effects. Some of the spiders discharge a fluid, which renders their bite dangerous. The *aranea avicularia*, and the *tarantula*, in particular, are well known; even the common spiders inflict a fatal wound on the insects they entangle in their web. The silk of the common silk-worm and other caterpillars, according to Malpighi, Lyonnet, and others, is a fluid contained in two vessels, which are of a considerable size at the extremity, and taper towards the mouth, and become very slender.

The *carabus* and *dytiscus* contain an acid which reddens the infusion of litmus. The ant contains an acid well known to chemists.

The acrid matter contained in the body of the *lytta vesicatoria*, is used in medicine, and forms the best epispastic we are acquainted with.

Generation of Insects.

INSECTS are the only animals without vertebræ in which the sexes are distinguished. Copulation is performed in them by the introduction of the parts of generation of the male into those of the female.

All insects are either male or female, except in a few of the genera of the order *Hymenoptera*, (such as the bee, ant, &c.) where individuals are to be found, which are neither male nor female; and, on that account called *neuters*. Among the bees, the neuters form the far greater part of the community, and perform the office of labourers. Among the ants, the neuters are very numerous, and constitute the only active members of the society. It has been alleged that these neuters are nothing but females, whose parts have not been developed for want of proper nourishment. Olivier, however, after strict examination, is disposed to think them really different, though he does not adduce facts sufficient to establish his opinion.

The parts which distinguish the male from the female, may be divided into two classes, viz. 1. Those which are not directly connected with generation. 2. Those which are absolutely necessary for the purposes of generation. The circumstances which have no direct communication with generation, which serve to point out the distinction between the sexes, are, 1. The difference of size, observable in the male and female. 2. The brightness of the colour in each. 3. The form and number of articulations of the antennæ. 4. The size and form of their wings. 5. The presence or absence of a sting. The male is always smaller than the female. The female ant is nearly six times larger than the male. The female cochineal is from 12 to 15 times the size of the male. The female *termes* is 200 or 300 times the size of the male. The colours of the male are commonly much more brilliant than those of the female; this is particularly the case in lepidopterous insects. In some insects, the colour of the male is totally different from that of the female. The antennæ of the male are commonly of a different form, and larger than those of the female. Frequently the males are furnished with wings, while the females have none; the

lampyris, *coccus*, and *blatta*, and several moths, afford an example of this. The female bee is furnished with a sting, while the male is destitute of one. The males of some insects are furnished with sharp prominent points, resembling horns, situated either on the head or breast, which are either not perceptible, or very faintly marked in the female. The parts essential to generation afford the best distinguishing mark. In most insects they are situated near the extremity of the rectum. By pressing the abdomen near to the anus they may frequently be made to protrude. But the parts of generation are not always situated near the anus. In the spiders they are situated in the feelers. In the *libellula*, the male organ is situated in the breast, while that of the female is placed at the anus.

Organs of Generation.

IN male insects, the organs which serve for the preparation of the semen, bear some resemblance to those organs in the animals which compose the class *Mammalia*. All of them have four organs, two of which may be compared to the testicles, and the other two to the *vesiculae seminales*. They vary very much in form in different species. During the period the male is usually employed in impregnating the female, these parts are very distinct; after that, they disappear totally. In the larger aquatic insects, (particularly in the *hydrophilus*) besides these four organs already mentioned, there are other two small vesicles which may be compared to the prostate gland of the superior animals. The *vasa deferentia* in the *hydrophilus* are somewhat reflected, its testicles are very large, and terminate in a very slender folded filament. In the grasshopper, these four organs are likewise found, but the *vesiculae seminales* are of a compound nature; the testicles have a good deal the appearance of those of the *mammalia*.

They are of an oval form, and are fixed to the inside of the back, their convex surface is covered with several tubes of a bright golden colour. After these yellow tubes have been removed, the testicles are easily unfolded; like all the other secretory organs of insects, they seem to be nothing but a collection of convoluted vessels. The *vesiculae seminales*, which are attached to the testicles, are formed into clusters. In the season of copulation, they increase in bulk so much as nearly to occupy three-fourths of the abdomen; they are full of a limpid fluid, which is the semen.

The *vasa deferentia*, which in most insects are very short, in the *blatta mucronata* are of a considerable length, and form several convolutions before they arrive at the penis.

The *penis*, in insects, is either single or double. Those which have a single penis, have it placed at the posterior extremity of the abdomen; in the *libellula*, however, it is placed at the anterior part: it is membranaceous externally; internally it is composed of a substance analogous to the *corpus cavernosum* of other animals; its form is either cylindrical or conical; it is furnished with two scales, one on each side, which form a sort of wedge; this wedge being introduced into the vagina of the female, and the scales being separated by means of particular muscles, which are situated at their base, open the vagina, and make way for the introduction of the penis.

General Observations.

penis. This singular construction is perhaps owing to the want of a proper erection.

Insects which have a double penis (such as the spider) have this organ placed at the extremity of the feelers of the lower jaw; these feelers are large in the male. During copulation, they are introduced into two vaginæ situated in the anterior part of the abdomen of the female. In these insects, the two small scales are likewise to be found, which serve to open the vagina of the female.

The female is furnished with two *ovaria*; they are long tubular canals, in which the eggs are arranged like a string of beads. The eggs which are situated next the opening into the oviduct, are largest, and they diminish gradually as they recede from it, till they disappear altogether. The tubular canals unite, and terminate in a common canal, which communicates with an oblong cavity, analogous to the uterus. It is in this cavity, that the semen of the male is deposited. Malpighi asserts, that the fluid penetrates into the oviduct, by means of a canal of communication, and that the eggs are fecundated the instant they pass the mouth of this canal, as they proceed towards the external orifice of the uterus.

In viviparous insects, such as the *hippobosca*, scorpion, &c. the *ovaria* are different. Sometimes the little animals are arranged in clusters; at other times they compose a spiral cord, the length of which corresponds to the number and size of the fœtus.

Copulation is not performed exactly in the same way by all insects. In most of the species, the male mounts on the back of the female; but the spiders, dragon-flies, and some others, have a mode of performing copulation peculiar to themselves. After copulation, they soon begin to lay their eggs. Some deposit their eggs gradually, one after another; others discharge them all at once, for example, the *ephemera*, the very short duration of whose existence renders this necessary. But the far greater number of insects lay them one by one. There are some which lay a considerable number at the same time. The large blue flesh-fly (*musca carnaria*) when it finds carrion in a proper state for the reception of its eggs, deposits a good number of them at once in the same place; but when it does not find a proper situation, in which to deposit its eggs, it can refrain for some time, till it find a proper place and opportunity. There are some insects that do not lay their eggs till a very long time after copulation; bees, wasps, &c. are impregnated before winter, but do not lay their eggs till spring.

Eggs of Insects.

THE eggs of insects are of two sorts; the first membranaceous, like the eggs of the tortoise, and the other reptiles; the other covered with a shell like those of the birds; their figure varies exceedingly; some are round, some elliptical, some lenticular, some cylindrical, some pyramidal, some flat, some square, but the round and oval are the most common. The eggs of insects seldom increase in size, from the time they have been deposited by the parent till they are hatched. Those of the *tenthredo*, however, and of some others, are observed to increase in bulk.

At first there is nothing to be perceived in the eggs of insects but a watery fluid; after some little time an obscure point is observable in the centre; which, ac-

General Observations.

ording to Swammerdam, is not the insect itself, but only its head, which first acquires consistence and colour. And the same author alleges, that insects do not increase in bulk in the egg, but that their parts only acquire shape and consistence. Under the shell of the egg there is a thin and very delicate pellicle, in which the insect is enveloped, which may be compared to the chorion and amnios which surround the fœtus in quadrupeds. The little insect remains in the egg till the fluids are dissipated, and till its limbs have acquired strength to break the egg, and make its escape. The different species of insects remain inclosed in the egg for very different periods. Some continue enclosed only a few days, others remain for several months. The eggs of many insects remain without being hatched during the whole winter; and the young insects do not come forth from them till the season at which the leaves of the vegetables on which they feed begin to expand. When the insects are ready to break their prison, they commonly attempt to pierce the shell with their teeth, and form a circular hole, through which they put forth first one leg, and then another, till they extricate themselves entirely.

Number of Insects.

INSECTS are by far the most numerous class of animals. About eleven thousand species have been described by Gmelin in the last edition of the System of Nature. A great many more have been described by other naturalists since the publication of that work, and a very considerable number are to be met with in the cabinets of the curious, which have not as yet been described by any author.

In those parts of the world which we are best acquainted with, we may easily suppose that many species of insects exist which have hitherto escaped notice. The minuteness of some insects makes them easily overlooked; the agility of others renders the catching of them difficult. The retired situations which many of them haunt favour their concealment. In the unexplored parts of America, Africa, and Asia, many hundred species must exist utterly unknown to naturalists. All these circumstances render it very probable that not one half of the insects which exist in the world have hitherto been described.

Utility of Insects.

INSECTS afford nourishment to a great number of the superior animals; many of the fishes, reptiles, and birds, draw the principal part of their sustenance from that source. The immense swarms of different species of crab which abound in every sea, directly or indirectly form the principal part of the food of the cod, haddock, herring, and a great variety of fishes. The snake, lizard, frog, and many other reptiles, feed both on land and aquatic insects. Gallinacious fowls, and many of the small birds, &c. feed on insects. Swallows, indeed, feed entirely on winged insects. They afford food likewise to many of the mammalia, viz. to many species of the bat, to the ant-eater, &c. and even to man himself. Many species of crab, viz. lobster, common crab, shrimp, prawn, landcrab, &c. are reckoned delicacies. The larvæ of some coleopterous insects and locusts form part of the food of man.

Insects likewise by consuming decayed animal and vegetable

History. vegetable matter, which if left to undergo the putrefactive process, on the surface of the ground, might taint the atmosphere with pestilential vapours, preserve the air pure for the respiration of man and other animals.

Preservation of Insects in Cabinets.

In collecting insects, both male and female ought if possible to be procured; and the time of the year when they are taken ought to be noted. Specimens with injured wings or antennæ must be rejected.

For collecting insects in their perfect state, a sort of forceps are made use of, which have their extremities covered with gauze. Besides these the entomologist, in his walks, should be furnished with a pincushion, stored with pins of various sizes, and a tin box lined with cork, of a convenient size for the pocket, in which the insects when caught are to be placed; the lepidopterous insects being first carefully killed by squeezing their thorax, lest their fluttering should injure their wings. Coleopterous insects are most expeditiously killed by being immersed in boiling water; and those who prefer this method may carry them home without injury in common pillboxes. Most insects are killed with a few drops of spirit of turpentine; the lepidoptera and hymenoptera may easily be killed by being stuck through with a pin dipped in aquafortis. When the insects are killed they are to be transfixed with pins, their wings, antennæ, and feet spread out and kept displayed. In some of the lepidoptera, two specimens should be preserved; the wings in the one displayed, and in the other placed as much as possible in their natural position.

Insects may likewise be collected by breeding them from their larvæ; and this, when it is convenient, is by

History. far the best method for procuring fine specimens; it is chiefly practised with the lepidopterous kinds. When the caterpillars are taken, they are to be fed on the leaves of the plant or tree on which they were found, and kept in a box with some moist earth at the bottom; they will afterwards turn into a chrysalis, either by going into the earth, by spinning a web and enclosing themselves in it, or by changing into a pupa *obscure*, according to their kinds. Having continued in this state their appointed time, the perfect insect will come forth, and must then be killed before it has injured its wings by flying.

Lepidopterous insects are likewise to be collected in their pupa state, by seeking for them under the projections of garden walls, pales, and out-houses, summer-houses, &c. or by digging for them in the winter months under the trees they feed on. When thus dug up, they are to be put into a box with moist earth, and kept till they come out.

When the insects are prepared in this manner, they are to be placed in the cabinet, which may consist of boxes or drawers deep enough to hold a long pin, and lined on the bottom with cork, or with wax; the insects of each order in drawers by themselves; and the different genera close together. The generic and trivial name of each insect is to be written on a piece of paper, fixed to the bottom by the same pin which supports the insect. The drawers must be made to shut very close, so as to exclude the dust and minute insects; some cover them with glass. A little camphor in each drawer is likewise useful.

Insects of the aptera order, such as spiders, scolopendræ, juli, &c. are best preserved in some kind of spirits. The onisci and cancri may be preserved like beetles.

HISTORY OF ENTOMOLOGY.

THOUGH the attention of man must have been attracted by the vegetables and animals with which he found himself surrounded, and by the earth and minerals on which he trod, even at the very earliest periods of human society, yet a very considerable time must have elapsed before any attempts were made at arrangement or classification. Aristotle was the first (as far as we know) who deserved the name of natural historian; his arrangement of animals was the only one followed for many centuries. He divided all animals into viviparous and oviparous; the first contained quadrupeds, the second birds, fishes and insects. Under insects were comprehended all small animals whose bodies were divided into segments. This definition of insects was followed by all natural historians down to the time of Linnaeus.

Theophrastus, the disciple of Aristotle, the only other person among the ancient Greeks who deserves the name of natural historian, bestowed the most of his attention on vegetables and minerals. Pliny has given us an account of all that was known in natural history down to his own times. Though he has mentioned many insects, owing to his want of method little is to be learnt from him respecting entomology. Dioscorides, who was nearly cotemporary with Pliny, has confined him-

self chiefly to natural history connected with medicine. He has given an enumeration of all the natural bodies which entered into the materia medica. On the revival of learning in Europe, writers on natural history seemed to have confined themselves to writing commentaries on the ancients; and nothing was done in entomology till the times of Gesner, who was the greatest naturalist the world had seen from the time of Aristotle, and who was the first who made a collection of the objects of natural history, and formed a museum. He was born in Zurich in 1516, and died in 1565. Aldrovandus lived nearly about the same time with Gesner, and, like him, formed a museum which served for the foundation of the public museum at Bologna, where many specimens may be still seen marked with the venerable hand of the first collector. Gesner formed his zoology on the principles of Aristotle: his history of animals is very voluminous. Aldrovandus made a collection of all that had been written on natural history before his own time, without discriminating truth from fiction. He has given a methodical arrangement of insects in the seventh book of his large work published in 1602. He followed nearly the same arrangement with Gesner. Gesner, in conjunction with some other natural historians, wrote a treatise on insects, which was published by

Mouffet,

History. Mouffet, an English physician. About this time our countryman, the illustrious Harvey, ventured to controvert Aristotle's erroneous opinion with respect to equivocal generation. Though his aphorism, *omnia ex ovo*, at first met with great opposition, it was at last established by his own experiments and those of Redi and Malpighi. From this period the writers on entomology have been numerous; we shall content ourselves here with giving little more than an enumeration of the principal works on the subject.

Agricola, in a work entitled *de Animalibus Subterraneis*, published in 1549, has given a methodical arrangement of insects: he divides them into, 1. Creeping insects; 2. Flying insects; and 3. Swimming insects. After giving this arrangement, he proceeds to give an account of each species.

A work entitled *Theatrum Insectorum Thomæ Mouffeti opera concinnatum*. Lond. 1634, the joint labour of several of the most eminent natural historians who lived about the middle of the sixteenth century, though not published till 1734, about 30 years after the death of Mouffet, by whose care the work had been abridged, and prepared to meet the public eye, is the next worthy of notice. It is divided into two books; the first treats of winged insects; the second of insects without wings: these two grand divisions are subdivided into several families characterized by the number and position of the legs. There is but little method displayed in the arrangement of the insects which compose the different families.

Aldrovandus divides insects into *terrestria et aquatica*, (land insects, and aquatic insects.) The different orders and subdivisions of these two classes, are for the most part determined by the number, nature and position of their wings and legs. He calls his first order *Favifica*, (those which form combs). As to the rest, according to his own declaration, he follows Aristotle.

Wolfgang Frenzius, in his *Historia Animalium sacra*, published in 1612, has divided insects into three classes, viz. 1. *Aeria*, (such as fly); 2. *Aquatica*, (such as inhabit the water). 3. *Terrea et Reptentia*, (such as creep about, or are lodged in the earth. His descriptions are much more accurate than those of any of the authors who preceded him.

John Johnston has borrowed freely from his predecessors, in his *Historia Naturalis Insectorum*, published in 1653. He divides insects into *terrestria* and *aquatica*, (into land and aquatic insects): the land insects he divides into three orders; 1. Such as have wings and legs; 2. Such as have legs without wings; and 3. Such as have neither wings nor legs. These three orders occupy his three first books; his fourth contains aquatic insects.

Walter Charleton follows the system of Aldrovandus in his *Onomasticon Zoicon*, published in 1668.

Jo. Goodart published *Metamorphosis et Historia Naturalis de Insectis*, 8vo. Mediob. 1667.

Likewise in 1675, a work of his appeared, *de Insectis in Methodum redactis, opera Mart. Lister*. Ebor. In this work insects are divided into ten families: the 1st includes butterflies with erect wings; 2d, Butterflies with horizontal wings; 3d, Butterflies with deflected wings; 4th, Libellulæ, (Dragon-flies); 5th, Apes, (bees); 6th, Coleopterous insects; 7th, Locusts, and grasshoppers; 8th, Flies corresponding to the order

History. diptera of Linnæus; 9th, Millepeds; and 10th, Spiders. This work is full of typographical errors and mistakes in natural history.

The discovery of the microscope in 1618, tended greatly to the advancement of entomology, as by means of it the most minute parts of insects could be viewed, and their organization examined. Naturalists were much engaged in making microscopic discoveries, particularly Borel, Rhedi, Swammerdam, Bonanni, Bonomo, Leeuwenhoek and Joblot.

John Swammerdam, in his *Biblia Naturæ*, published in 1669, has divided insects into four classes.

John Ray published his *Historia Insectorum*. Lond. 1710. This work was properly the joint production of J. Ray and Francis Willoughby. These illustrious friends laboured together with uncommon ardour in the study of nature. Death carried off Willoughby in the prime of life, before he had properly digested what the industry of his early years had collected; and his labours would have been lost to the world, and his name might have sunk in oblivion, but for the friendship of Ray. So close was the intercourse between these two naturalists, and so intimately were their labours blended together, that it is not easy to assign each his due share of merit. Indeed Ray has been so partial to the fame of his departed friend, and has cherished his memory with such affectionate care, that we are in danger of attributing too much to Mr Willoughby, and too little to himself. Though what Dr Derham asserts be not correct, that Mr Willoughby had taken the animal kingdom for his task, and Mr Ray the vegetable one, yet it is generally agreed, that the *Historia Insectorum* is principally to be ascribed to Willoughby. In that work insects are divided into *Transmutabilia et Intransmutabilia*, (those which undergo a metamorphosis, and those which undergo none). These two grand divisions are subdivided into several orders, which are ascertained by the number of their legs, or total want of legs; by the places which they inhabit; by their size; by the configuration of the various parts of the body; by the smell which they diffuse, &c. The *transmutabilia* are divided into four orders. 1. *Vaginipennes*, (those which have their wings covered with a sheath). 2. *Papiliones*, (lepidopterous insects). 3. *Quadripennes*, (those which have four wings); and 4. *Bipennes*, (those which have two). The papiliones, quadripennes, and bipennes are again subdivided into families, the characters of which are taken, either from the appearance and conformation of their larvæ, or from the form, colour and different properties of the perfect insect.

Eleazar Albin published a natural history of English insects in 1720. He likewise published the Natural History of Spiders in 1736.

Antony Valisnieri, in his work entitled *Esperienze e Osservazioni intorno agli Insetti*, published in 1730, has divided insects into four orders, according to the situation in which they pass their lives.

Mary Sybelle Merian, published in 1730, *Histoire d'Insectes d'Europe et de Surinam*. She likewise published in 1705, *Metamorphosis Insectorum Surinamensium ad vivum picta et descripta*; and in 1717, *Eruucarum Ortus*.

George Bernard Rhump published in 1705, and again in 1741, a work entitled *Amboinische Ravitukammer*.

History.

Hans Sloane, in the years 1707 and 1725, published a Voyage to the Islands of Madeira, Barbadoes, Nevis, Saint Christophers and Jamaica.

Henry Ruifch in 1710 and 1718 published *Theatrum Universale omnium Animalium*.

J. Petiver published in 1715 his *Icones et Nomina Aquatilium Animalium Amboinæ*.

Richard Bradley published in 1721 his Philosophical Account of the Works of Nature.

Linnæus, the most celebrated natural historian the world ever produced, in his first edition of the *Systema Naturæ*, published in 1735, divided insects into four orders, from the number and different appearances of their wings; 1. *Coleoptera*; 2. *Angioptera*; 3. *Hemiptera*; and 4. *Aptera*. This was but an imperfect sketch, a first essay. In the subsequent editions of the System of Nature which he published, to the number of twelve, he completed the arrangement of insects, of which we need say nothing here, as we have followed it in preference to all others; and most authors who have written on the subject for more than half a century past have either followed it closely, or with very slight alterations. His extensive genius embraced all the three kingdoms of nature. In botany and entomology in particular he far excels all who went before him, and as yet remains unrivalled. Writers on entomology became so numerous after Linnæus had published his System of Nature, and established entomology on a solid foundation, that a mere enumeration of their names and titles of their books would occupy more room than we can afford to bestow on this article; we shall therefore only notice a few of the most remarkable.

Charles Degeer, in his *Memoires pour servir à l'Histoire des Insectes*, in 1752, has arranged insects into fourteen orders, distinguished by the different appearances of the various parts which compose their bodies, particularly the elytra, wings, and most remarkable parts of the head. He published again in 1778.

M. de Reaumur published his *Memoires pour servir à l'Histoire des Insectes* at Paris in 1737. No one has paid so much attention to the habits of insects, and to every thing that concerns them, as Reaumur. He ought to be read by every student of entomology.

John Retzius, has simplified the arrangement of Degeer, in a small work entitled *Genera et Species Insectorum*. But although in this arrangement he has followed the method of Degeer, the terms he has made use of are principally those of Linnæus. His 14 orders are, 1. *Lepidoptera*. 2. *Alingua*. 3. *Neuroptera*. 4. *Hymenoptera*. 5. *Siphonata*. 6. *Dermaptera*. 7. *Hemiptera*. 8. *Coleoptera*. 9. *Halterata*. 10. *Proboscidea*. 11. *Suctoria*. 12. *Ancenata*. 13. *Atrachelia*. 14. *Crustacea*.

M. Geoffroy, in his *Histoire Abrégée des Insectes*, published at Paris in 1762, has divided insects into six orders; *Coleopteres*, *Hemipteres*, *Tetrapteres ailes farineuses*, *Tetrapteres ailes nues*, *Dipteres*, and *Apteres*. He determined his families by the number of the articulations of the feet, and his genera by characters drawn from all the parts of the body. He has formed a great number of new genera.

John Antony Scopoli, in his *Entomologia Carniolica*, published in 1762, has followed the arrangement of Linnæus, and only changes the names of some of the orders; e. g. *Proboscidea*, instead of *Hemiptera*; *Acu-*

leata, instead of *Hymenoptera*; *Halterata*, instead of *Diptera*; and *Pedestria*, instead of *Aptera*.

J. C. Schæffer published in 1766, *Elementa Entomologica*, 135 *tabulæ ære excussæ*; he follows in many points the method of Linnæus. He divides insects into seven classes. 1. *Coleoptero-macroptera*. 2. *Coleoptero-microptera*. 3. *Hemiptera*. 4. *Hymeno-lepidoptera*. 5. *Hymeno-gymnoptera*. 6. *Diptera*; and 7. *Aptera*. His first and second classes correspond with the *Coleoptera* of Linnæus; the fourth with the *Lepidoptera*, and the fifth with the *Hymenoptera*.

John C. Fabricius is the founder of a new system of Entomology, which he published in his *Systema Naturæ* 1775. He discriminates his orders and genera, by the parts of the mouth, (*instrumenta cibaria*). He afterwards published *Species Insectorum*, *Entomologia Systematica*, and *Mantissa Insectorum*.

The arrangement of Fabricius has acquired great reputation, especially on the continent. It may not therefore be amiss to give a slight view of it. He divides insects into eight classes.

- Class I. **ELEUTHERATA**. Mouth armed with jaws, and four or six feelers. The jaws naked and free.
- Class II. **ULANATA**. The jaws covered with an obtuse helmet.
- Class III. **SYNISTATA**. The jaws united with the lip.
- Class IV. **AGONATA**. The under jaw wanting.
- Class V. **UNOGATA**. Mouth armed with jaws and two feelers; the under jaw generally furnished with a small unguis or nail.
- Class VI. **GLOSSATA**. Mouth furnished with feelers, and a spiral tongue.
- Class VII. **RHYNGOTA**. Mouth furnished with a snout, and an articulated sheath.
- Class VIII. **ANTLIATA**. Mouth furnished with a haustellum and a sheath not articulated.

In a supplement to his *Entomologia Systematica*, he has divided insects into thirteen orders. 1. *Eleutherata*. 2. *Ulonata*. 3. *Synistata*. 4. *Piezata*. 5. *Odonata*. 6. *Mitofata*. 7. *Unogata*. 8. *Polygonata*. 9. *Kleistagnatha*. 10. *Exochinata*. 11. *Glossata*. 12. *Rhyngota*. 13. *Anthliata*. He has lately published a work entitled *Systema Eleutheratorum*, no more than two volumes of which have as yet made their appearance.

Moses Harris published an Exposition of English Insects, &c. with coloured plates, 1776.

Jo. Christ published *Philosophia Entomologica sistens scientiæ fundamenta*, &c. Hamb. 1778, 8vo.

Archiv. der Insektengeschichte herausgegeben von Joh. Casp. Fuesly. Zurich, 1781.

Fr. Paula, v. Schrank; *Enumeratio Insectorum Austriae indigenorum*. Aug. Vindel. 1781.

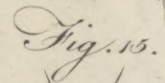
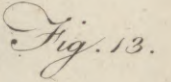
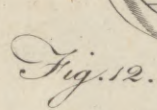
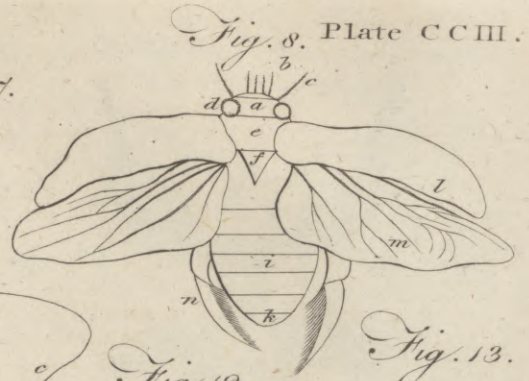
P. Sim. Pallas; *Icones Insectorum*. Hamb. 1781.

A. W. Knock; *Beytraege zur Insektengeschichte*, 1781.

James Barbut published the *Genera Insectorum* of Linnæus, exemplified by various specimens of English insects drawn from nature. Lond. 1781.

John Nepomuk de Laicharting, has divided insects into ten orders, characterized by the configuration of various parts of the body. He adheres pretty closely to the

History.



Order I. Coleoptera.

Fig. 16. *Scarabaeus Hercules.*
Hercules Beetle.

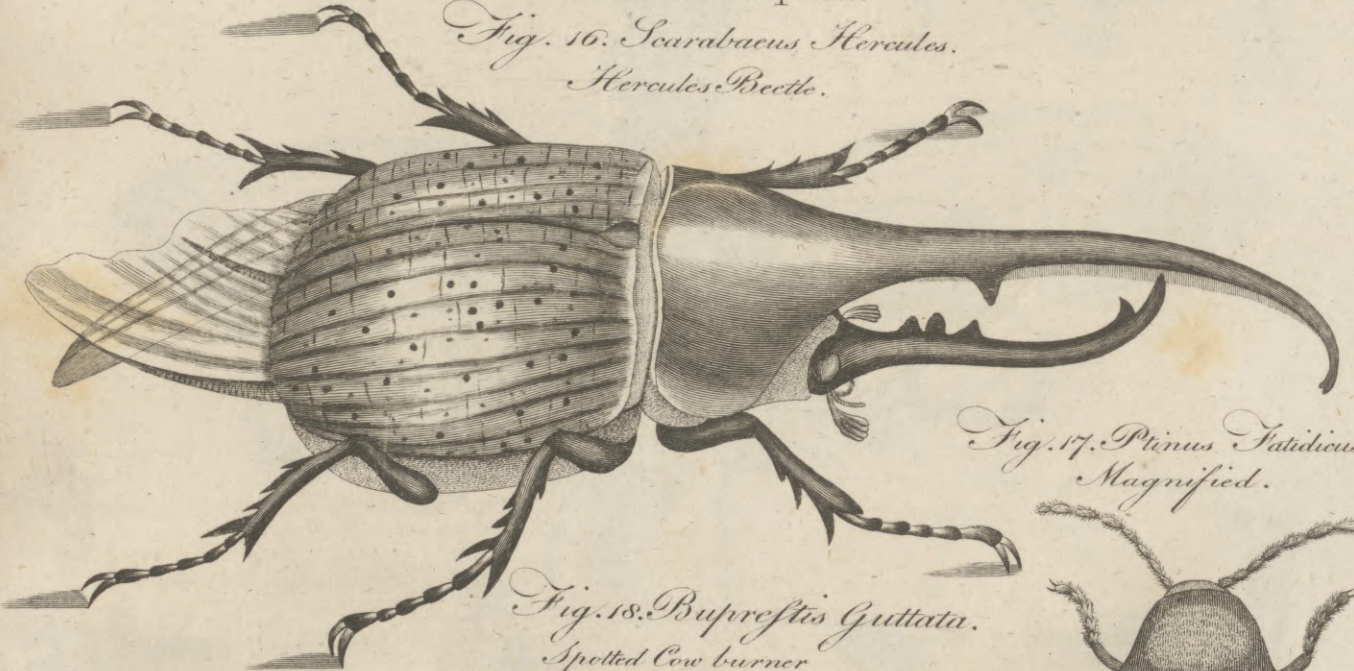


Fig. 17. *Ptinus Faticidicus.*
Magnified.



Fig. 18. *Buprestis Guttata.*
Spotted Cow burner



Fig. 19. *Carabus Vulgaris.*
Common Carabus.



Fig. 19. *Carabus Coriaceus.*
Shagreen Carabus.

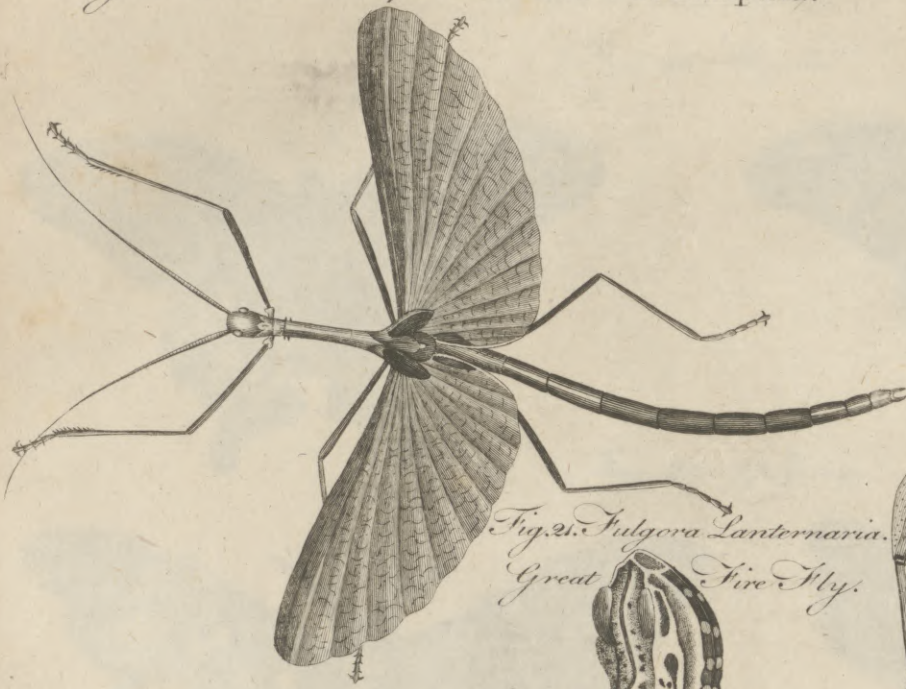


Fig. 17. *Ptinus Faticidicus.*
Death watch.



Fig. 20. Mantis Bispinosa.

*Fig. 20. Mantis Siccifolia.
the Walking Leaf.*



*Fig. 21. Fulgora Lanternaria.
Great Fire Fly.*



Fig. 22. Notonecta Boat Fly.

*Fig. 24. Aphis.
Plant Louse.*



Fig. 23. Cimex Bug.

Fig. 25. Coccus.



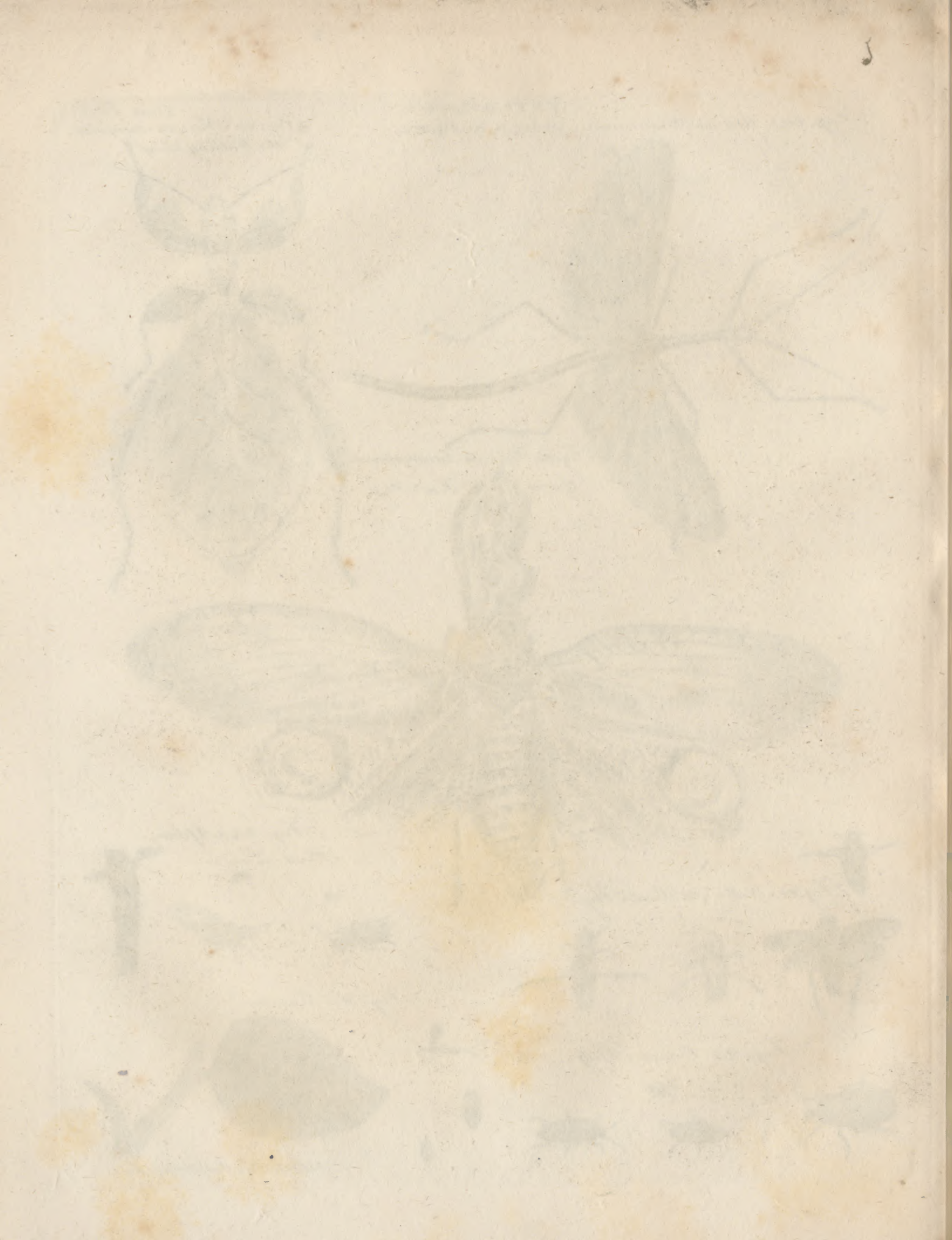


Fig. 26. Papilio.



Fig. 27. Sphinx.



Fig. 28. Phalaena.



Fig. 30. Hemerobius.

Order IV. Neuroptera.

*Fig. 29. Libellula.
Dragon Fly.*

Fig. 31. Panorpa.



Fig. 30.



ENTOMOLOGY.
 Order V. Hymenoptera.
 Fig. 33. Ichneumon.

Fig. 32. Tenthredo.



Fig. 34.
Chrysis.



Fig. 35.
Formica.



order VI. Diptera.

Fig. 36. Oestrus.



Fig. 37. Tipula.



Fig. 38. Asilus.



Fig. 39. Lepisma



Order VII. Aptera.

Fig. 40. Aranea Spider.



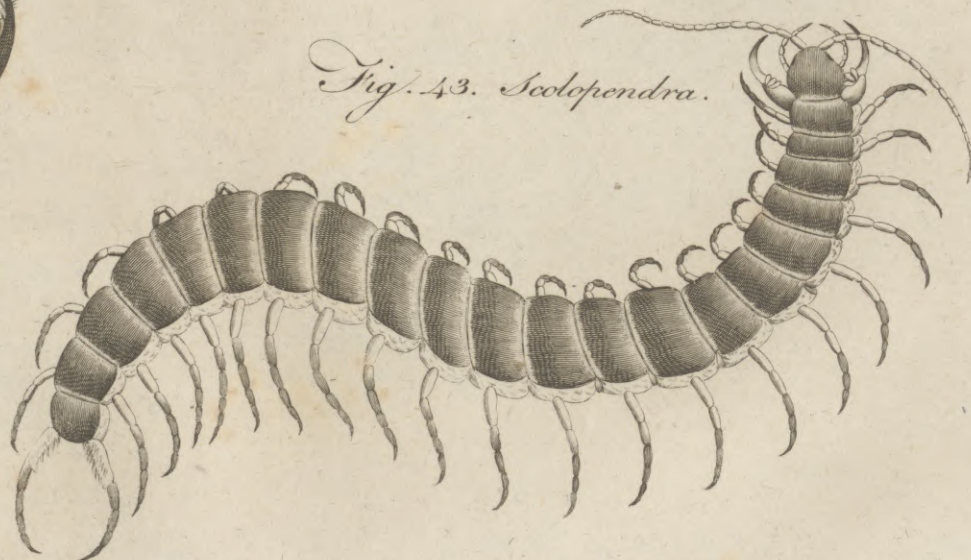
Fig. 42. Cancer



Fig. 41.
Scorpio.



Fig. 43. Scolopendra.



History. the method of Linnæus. His orders are, 1. Scarabæoides. 2. Grylloides. 3. Cimicioides. 4. Papilionoides. 5. Libelluloides. 6. Vespoïdes. 7. Muscoides. 8. Cancroides. 9. Aranoides, and 10. Oniscoides.

Olivier, in 1780, published *Entomologie, ou Histoire Naturelle des Insectes*, in 3 vols. 4to. Paris. In 1790, in the *Dictionnaire des Insectes*, forming a part of the *Encyclopedie Methodique*, he has given an arrangement of insects little different from that of Linnæus. He has added one order which he calls Orthopteres, distinguished by the mode of folding the lower wings, and a part on the head, which he terms *galea*. He has likewise subdivided the order Aptera, into Arachnides and Crustaces. Latreille in 1795, in a work entitled *Precis du Caractere des Genres*, divides insects into two grand divisions, viz. *insectes ailés, et insectes apteres*, (winged insects, and insects without wings). These two grand divisions he subdivides into 14 orders. 1. Coleopteres. 2. Orthopteres. 3. Hemipteres. 4. Neuropteres. 5. Lepidopteres. 6. Suceurs. 7. Thyfanoures. 8. Parasites. 9. Acephalés. 10. Entomostraces. 11. Crustaces. 12. Myriapodes. Since that he has published a more detailed account of this method in a work entitled *les Genres et les Familles des Insectes*.

Clairville in 1798, in the introduction to his *Entomologie Helvetique*, has given an arrangement of insects,

in which he differs from Linnæus almost in nothing, except in the names of his orders, viz. Elytropteres, Dicotyopteres, Thlebopteres, Halipteres, Lepidopteres, Heminopteres, Rophoteires, and Pododuneres.

Link, in his *Magazin fur Thiergeschichte*, has divided insects into eleven orders; he follows de Laicharting almost in every thing, even in the names of his orders; he has indeed added an order which he calls Pediculoides.

Cuvier and Dumeril, in their Comparative Anatomy, have very nearly followed the method of Linnæus; they have however divided the order Aptera into two, viz. Gnathaptera and Aptera; they have likewise altered the arrangement of the orders, and have placed those first which contain insects furnished with jaws, viz. Gnathaptera, Neuroptera, Hymenoptera, Coleoptera, and Orthoptera; and have thrown those last which are destitute of jaws, viz. Hemiptera, Lepidoptera, Diptera and Aptera.

We shall refrain from noticing those authors who have written partial treatises; though there are several works of that kind which the entomologist might peruse with advantage, such as the *Fauna Suecica*, published in 1761 by Linnæus, at Stockholm. *Fauna Germanica*, by Panzer. *La Faune Parisienne de Walknair*. Kirby's *Monographia apum Angliæ*. Latreille's treatise on Ants.

EXPLANATION OF THE PLATES.

PLATE CCHII.

- Fig. 1. ANTENNÆ PECTINATÆ, or feathered; as in the *phalæna*, moths.
 2. ——— PERFOLIATÆ, or perfoliated; as in the *dermestes* and *dytiscus*.
 3. ——— FISSILES, or fissile, divided into laminæ at the extremity, as in the *scarabæi*, beetles.
 4. ——— CLAVATÆ, or club-shaped, as in the *papilio*, butterfly.
 5. ——— MONILIFORMES, like a necklace of beads; as in many of the *phalæna*.
 6. ——— SETACEÆ, setaceous, or bristle-shaped; as in many of the *phalæna*.
 7. ——— ARISTATÆ, furnished with a lateral hair, as in the *fly*.
 8. 9. *a*, Caput, the head.
b, Palpi, or feelers.
c, Antennæ, or horns.
d, Oculi, the eyes.
e, Thorax.
f, Scutellum, or escutcheon.
g, Pectus, or breast.
h, Sternum, or breast-bone.
i, Abdomen, and its segments.
k, Anus.
l, Elytra, or shells.
m, Membranous wings.
n, Pedes, or feet, which are natatorii.

10. *o*, Femur, or thigh.
p, Tibia, or leg.
q, Tarsus, or foot.
r, Unguis, or claw.
 11. *a*, The anterior part of the wing.
b, The posterior part.
c, The exterior part.
d, The interior part.
e, The margin.
f, The disk, or middle.
g, Oculus, or eye.
 12, 13, 14, 15. Represent the insect in its egg, caterpillar, pupa, and perfect state.

- Order I. COLEOPTERA. Fig. 16. *Scarabæus*. Fig. 17. *Ptinus*. Fig. 18. *Buprestis*. Fig. 19. *Carabus*.
 Order II. Fig. 20. *Mantis*. Fig. 21. *Fulgora*. Fig. 22. *Notonecta*. Fig. 23. *Cimex*. Fig. 24. *Aphis*. Fig. 25. *Coccus*.
 Order III. Fig. 26. *Papilio*. Fig. 27. *Sphinx*. Fig. 28. *Phalæna*.
 Order IV. Fig. 29. *Libellula*. Fig. 30. *Hemera-bius*. Fig. 31. *Panorpa*.
 Order V. Fig. 32. *Tenthredo*. Fig. 33. *Ichneumon*. Fig. 34. *Chrysis*. Fig. 35. *Formica*.
 Order VI. Fig. 36. *Oestrus*. Fig. 37. *Tipula*. Fig. 38. *Aphus*.
 Order VII. Fig. 39. *Lepisma*. Fig. 40. *Aranea*. Fig. 41. *Scorpio*. Fig. 42. *Cancer*. Fig. 43. *Scolopendra*.

I N D E X.

A			
<i>ABDOMEN</i> ,		p. 146	
<i>Acarus</i> ,		219	
<i>Achivi</i> , a subdivision of papilio,	183,	184	
<i>Aethæon</i> , largest coleopterous insect known,		152	
<i>Aculeus</i> ,		147	
<i>Adonidum</i> , species of coccus,		176	
<i>Afer</i> , species of scorpio,		224	
<i>Aliment</i> of insects,		230	
<i>Alurnus</i> ,		157	
<i>Animal</i> cotton,		199	
<i>Ant</i> ,		207	
<i>Ant-eater</i> ,		196	
<i>Ant-eggs</i> ,		207	
<i>Ants</i> do not store up for the winter,		146	
<i>Antennæ</i> ,		230	
use of,		156	
<i>Anthrenus</i> ,		146	
<i>Anus</i> ,		160	
<i>Apalus</i> ,		175	
<i>Aphides</i> , propagation of		162	
<i>Aphis</i> ,		203	
<i>Apiarius</i> , species of attelabus,		147, 215	
<i>Apis</i> ,		221	
<i>Aptera</i> ,		227	
<i>Aranea</i> ,		214	
<i>Armadillo</i> , species of oniscus,		225	
<i>Aphis</i> ,		190	
<i>Astacus</i> ,		188	
<i>Atlas</i> , species of phalæna,		189	
<i>Atrops</i> , species of sphinx,		161	
<i>Atacos</i> , a subdivision of phalæna,		170	
<i>Attelabus</i> ,		222	
<i>Auricularia</i> , species of forficula,			
<i>Avicularia</i> , species of aranea,			
B			
<i>Barded</i> ,		146	
<i>Back</i> ,		ib.	
<i>Beak</i> ,		ib.	
<i>Bee</i> ,		203	
<i>Beetle</i> ,		152	
<i>Blatta</i> ,		171	
<i>Blistering-fly</i> ,		169	
<i>Blossom-eater</i> ,		ib.	
<i>Boat-fly</i> ,		173	
<i>Bombyces</i> , division of phalæna,	189,	190	
<i>Bombylus</i> ,		214	
<i>Bond</i> ,		160	
<i>Bostrichus</i> ,		154	
<i>Botts</i> ,		209	
<i>Bovinus</i> , species of tabanus,		213	
<i>Bovis</i> , species of oestrus,		208	
<i>Breast</i> ,		146	
<i>Breeze</i> ,		208	
<i>Brentus</i> ,		160	
<i>Bruchus</i> ,		159	
<i>Bug</i> ,		p. 173	
when introduced into Europe,		174	
<i>Bull-comber</i> ,		152	
<i>Bullhead</i> ,		167	
<i>Buprestis</i> ,		166	
<i>Butter-fly</i> ,		182	
<i>Buz-fly</i> ,		214	
<i>Byrrhus</i> ,		156	
C			
<i>Cacao</i> , species of bruchus,		159	
<i>Cæli</i> , species of coccinella,		157	
a species of coccus,		176	
<i>Caddo</i> ,		195	
<i>Caddy</i> ,		ib.	
<i>Calcitrans</i> , a species of stomoxys,		214	
<i>ib.</i>		163	
<i>Calopus</i> ,		177	
<i>Campeficane</i> cochineal,		177	
<i>Cancer</i> ,		224	
<i>Cancroides</i> , species of phalangium,		221	
<i>Candelaria</i> , species of fulgora,		173	
<i>Candidi</i> , a subdivision of papilio,		183	
<i>Cantharis</i> ,		165	
<i>Capitate</i> ,		146	
<i>Carabus</i> ,		167	
<i>Carnaria</i> , species of musca,		211	
<i>Carrion-beetle</i> ,		156	
<i>Carrion-eater</i> ,		164	
<i>Cassida</i> ,		157	
<i>Cæciens</i> , species of tabanus,		213	
<i>Cells</i> of wasps, how formed,		202	
<i>Centuncularis</i> , species of bee,		203	
<i>Cerambyx</i> ,		162	
<i>Cerraria</i> , a species of phalæna,		192	
<i>Cerella</i> , a species of phalæna,		194	
<i>Chalcis</i> ,		201	
<i>Cheese-mite</i> ,		220	
<i>Chela</i> ,		147	
<i>Chermes</i> ,		176	
<i>Chermes</i> grains,		182	
<i>Chrysalis</i> ,		147	
<i>Chrysis</i> ,		201	
<i>Chrysomela</i> ,		158	
<i>Cicada</i> ,		173	
<i>Cicindela</i> ,		166	
<i>Cimex</i> ,		174	
<i>Circulation</i> of fluids in insects,		233	
<i>Clavated</i> ,		146	
<i>Claw</i> ,		147	
<i>Clock-beetle</i> ,		153	
<i>Coccinella</i> ,		157	
<i>Coccus</i> ,		176	
<i>Cochineal</i> ,		ib.	
falsely supposed a vegetable production,		177	
introduced into Bengal,		178	
<i>Cock-chaffer</i> ,		153	
<i>Cock-roach</i> ,		171	
<i>Coleoptera</i> ,		147, 152	
<i>Colombaschensis</i> , species of musca,		212	
<i>Comparative</i> quantity of wax made from fugar and from honey,		p. 206	
<i>Conops</i> ,		214	
<i>Cossus</i> , species of phalæna, eaten by the Romans,		191	
<i>Cow-burner</i> ,		166	
<i>Crab</i> ,		224	
<i>Crabro</i> , species of vespa,		202	
<i>Crane-fly</i> ,		210	
<i>Crangon</i> , species of cancer,		225	
<i>Cratægi</i> , a species of papilio,		185	
<i>Craw-fish</i> ,		225	
<i>Cricket</i> ,		171	
<i>Cryptocephalus</i> ,		158	
<i>Cuckow-spit</i> ,		173	
<i>Cucujus</i> ,		165	
<i>Culex</i> ,		213	
<i>Culinaris</i> , a species of tenebrio,		168	
<i>Curculio</i> ,		160	
<i>Cynips</i> ,		197	
D			
<i>Danai</i> , a division of papilio,	183,	185	
<i>Day-fly</i> ,		195	
<i>Death-watch</i> ,		155	
<i>Dentated</i> ,		147	
<i>Dermeestes</i> ,		154	
<i>Destructor</i> , a species of acarus, species of termes,		220	
<i>Deflected</i> ,		146	
<i>Diamond-beetle</i> ,		160, 161	
<i>Diopfis</i> ,		210	
<i>Diptera</i> ,		147, 208	
<i>Domestica</i> , species of musca,		211	
<i>Domesticus</i> , species of gryllus,		172	
<i>Door-beetle</i> ,		153	
<i>Dragon-fly</i> ,		194	
<i>Drone-bee</i> ,		203	
<i>Dung-beetle</i> ,		153	
<i>Dysenterica</i> , species of acarus,		220	
E			
<i>Ear-wig</i> ,		170	
<i>Economy</i> of termes fatale,		216	
<i>Elater</i> ,		165	
<i>Elytra</i> ,		147	
<i>Emmet</i> ,		207	
<i>Empis</i> ,		213	
<i>Ephemera</i> ,		195	
<i>Equi</i> , species of oestrus,		209	
<i>Equina</i> , species of hippobosca,		215	
<i>Equites</i> , a division of papilio,		183	
<i>Erodium</i> ,		169	
<i>Eruca</i> ,		147	
<i>Eyes</i> of insects,		229, 146	
<i>Experiments</i> of Maupertuis on scorpions,		223	
<i>Extremities</i> ,		146	
		F	

F			
<i>Farina</i> of flowers, the food of the young bees,	p. 205	<i>Hapiali</i> , a division of phalæna,	p. 190, 194
<i>Farinalis</i> , a species of phalæna,	193	<i>Hearing</i> of insects,	229
<i>Fastigata</i> ,	147	<i>Heliconii</i> , a division of papilio,	183, 185
<i>Fatale</i> , a species of termes,	216	<i>Hemelytra</i> ,	147
<i>Fausta</i> , species of mantis, a Hottentot deity,	171	<i>Hemiptera</i> ,	147, 171
<i>Feelers</i> ,	146	<i>Hemerobius</i> ,	196
<i>Female</i> bee,	203	<i>Hippobosca</i> ,	215
<i>Festivi</i> , a division of papilio,	183, 188	<i>Hispa</i> ,	159
<i>Ficus indica</i> , food of the lac insect,	180	<i>Hister</i> ,	155
<i>religiosa</i> , food of the lac insect,	<i>ib.</i>	<i>Hominis</i> , a species of œstrus,	210
species of coccus,	<i>ib.</i>	<i>Honey</i> bee,	202
<i>Field-cricket</i> ,	172	<i>Horia</i> ,	165
<i>Figulus</i> , species of sphex,	200	<i>Hornet</i> ,	202
<i>Filiform</i> ,	146	<i>Horse-fly</i> ,	219
<i>Fire-fly</i> ,	164	<i>House-bug</i> ,	174
<i>Fissile</i> ,	146	<i>House-cricket</i> ,	172
<i>Flea</i> ,	219	<i>House-fly</i> ,	211
<i>Flowers</i> do not always contain honey,	208	<i>Humble-bee</i> ,	206
<i>Fly</i> ,	210	<i>Humile</i> , a species of phalæna,	194
<i>Forceps</i> ,	147	<i>Hyalina</i> , a species of fulgora,	173
<i>Forficula</i> ,	170	<i>Hydrachna</i> ,	220
<i>Fornica</i> ,	207	<i>Hydrophilus</i> ,	167
<i>Formicarius</i> , species of attelabus,	161	<i>Hymenoptera</i> ,	147, 197
species of myrmeleon,	148	I	
<i>Fossoria</i> , species of vespa,	202	<i>Ichneumon</i> ,	199
<i>Frit</i> , species of musca,	212	<i>Ilicis</i> , a species of coccus,	182
<i>Frog-hopper</i> ,	173	<i>Imago</i> ,	147
<i>Frumentarius</i> , a species of curculio, injurious to corn,	160	<i>Imperialis</i> , a species of curculio,	161
<i>Fulgora</i> ,	172	<i>Incumbent</i> ,	146
<i>Fullo</i> , largest British scarabæus,	183	<i>Insect</i> , definition of,	<i>ib.</i>
<i>Furca</i> ,	147	<i>Insects</i> , characters of,	148
G		classification of,	147
<i>Gad-fly</i> ,	208	<i>Irritants</i> , a species of pulex,	219
<i>Gall-fly</i> ,	197	a species of stomoxys,	214
<i>Gammatus</i> , species of cancer,	225	<i>Itch</i> insect,	220
<i>Gemmati</i> , a subdivision of papilio,	183, 186	<i>Iulus</i> ,	228
<i>Geometra</i> , a division of phalæna,	189, 192	<i>Jaculator</i> , a species of ichneumon,	199
<i>Generation</i> of insects,	234	<i>Japonica</i> , a species of lampyris,	164
<i>Gigur</i> ,	219	<i>Jarpeada</i> , a kind of cochineal,	177
<i>Glomeratus</i> , a species of ichneumon,	200	L	
<i>Glow-worm</i> ,	164	<i>Lacca</i> ,	180
<i>Glutton</i> ,	159	<i>Lac</i> insect,	<i>ib.</i>
<i>Gnat</i> ,	213	<i>Lady-bird</i> ,	157
<i>Golden-fly</i> ,	201	<i>Lady-cow</i> ,	156
<i>Grana-fina</i> , compared with grana-fylvestris,	179	<i>Lampyris</i> ,	164
<i>Grana-fina</i> , compared with Bengal cochineal,	180	<i>Land</i> crab,	224
<i>Grana fylvestris</i> improveable,	179	<i>Lanternaria</i> , a species of fulgora,	173
<i>Granarius</i> , a species of curculio, injurious to grain,	160	<i>Lanthern-fly</i> ,	172
<i>Granella</i> , a species of phalæna,	144	<i>Larva</i> ,	147
<i>Gryllotalpa</i> , a species of gryllus,	172	<i>Latro</i> , a species of cancer,	225
<i>Gryllus</i> ,	171	<i>Leather-eater</i> ,	154
<i>Gum-lac</i> ,	180	<i>Leëularis</i> , a species of cimex,	174
<i>Cyrinus</i> ,	155	<i>Lepidoptera</i> ,	147, 192
H		<i>Lepisma</i> ,	215
<i>Habitations</i> of the white ant,	211	<i>Leptura</i> ,	163
<i>Hæmorrhoidalis</i> , a species of œstrus,	209	<i>Leucopsis</i> ,	201
<i>Halteres</i> ,	147	<i>Libellula</i> ,	194
<i>Hawk-moth</i> ,	187	<i>Lion-ant</i> ,	196
		<i>Lobster</i> ,	225
		<i>Locust</i> ,	172
		<i>Locustæ</i> ,	<i>ib.</i>
		<i>Long-legged</i> spider,	221
		<i>Louse</i> ,	218
		<i>Lousy</i> beetle,	153
		<i>Lucanus</i> ,	
		<i>Lytta</i> ,	
		M	
		<i>Machaon</i> , a species of papilio,	181
		<i>Macrocephalus</i> ,	175
		<i>Male-bee</i> ,	203
		<i>Manticora</i> ,	169
		<i>Mantis</i> ,	171
		<i>Mastique</i> cochineal,	177
		<i>Maurus</i> , a species of scorpio,	224
		<i>Maxilla</i> ,	146
		<i>May</i> bug,	153
		<i>Mellifica</i> , a species of apis,	203
		<i>Melonella</i> , a species of phalæna,	194
		<i>Meloc</i> ,	169
		<i>Melolontha</i> ,	153
		<i>Melyris</i> ,	183
		<i>Metamorphosis</i> ,	147
		<i>Meteorica</i> , a species of musca,	212
		<i>Method</i> of rearing cochineal,	177
		<i>Migratorius</i> , a species of gryllus,	172
		<i>Mite</i> ,	219
		<i>Mole-cricket</i> ,	172
		<i>Molitor</i> , a species of tenebrio,	168
		<i>Moniliform</i> ,	146
		<i>Monoculus</i> ,	226
		<i>Mordella</i> ,	170
		<i>Mori</i> , a species of phalæna,	191
		<i>Morio</i> , a species of apis,	207
		<i>Morficans</i> , a species of scolopendra,	228
		<i>Moth</i> ,	183
		<i>Musca</i> ,	210
		<i>Musquito</i> ,	217
		<i>Mutilla</i> ,	207
		<i>Myrmeleon</i> ,	196
		N	
		<i>Navalis</i> , a species of cantharis, injurious to oak timber,	165
		<i>Necydalis</i> ,	164
		<i>Negra</i> , a kind of cochineal,	177
		<i>Nepa</i> ,	174
		<i>Neuroptera</i> ,	147, 194
		<i>Neuter</i> bee,	203
		<i>Neuters</i> ,	147
		<i>Nibbler</i> ,	170
		<i>Nidulans</i> , a species of aranea,	222
		<i>Nympha</i> ,	147
		<i>Nymphalis</i> , a division of papilio,	183, 186
		<i>Nitidula</i> ,	164
		<i>Noëtilucus</i> , a species of elater,	166
		<i>Noëtuæ</i> , a division of phalæna,	189, 193
		<i>Nopal</i> , food of the true cochineal,	177
		<i>Notoneëta</i> ,	173
		<i>Notoxus</i> ,	162
		<i>Number</i> of bees in a hive,	203
		of species of insects,	228, 235
		<i>Number</i> of botts in the stomach of horses,	209
		<i>Nursing</i> bees,	204
		O	
		<i>Ocelli</i> ,	147
		<i>Oëstrus</i> ,	209
		<i>Oleracea</i> , a species of tipula,	210
		<i>Oleraceus</i> , a species of cimev	174
		<i>Oniscus</i> ,	227
		H h	
		<i>Opatrum</i> ,	

- Opatrum*, p. 156
Opilio, a species of phalangium, 221
Organization of insects, 228
Organs of digestion of insects, 237
 generation, 234
 mastication, 231
Orientalis, a species of blatta, 171
Orni, a species of cicada, larva eatable, 173
Ovis, a species of œstrus, 209
Ox-fly, 213
- P
- Pagurus*, a species of cancer, 225
Palpe, 146
Panorpa, 196
Papilio, 182
Paraplecticus, a species of curculio, supposed to be the cause of staggers in horses, 160
Parnassii, a division of papilio, 183, 185
Pastil, a preparation of coccus ilicis, 182
Pausus, 159
Pediculus, 218
Pectinated, 146
Penetrans, a species of pulex, 219
Perfoliated, 146
Phalangium, 221
Phalæna, 189
Phalerati, a subdivision of papilio, 183
Phosphoria, a species of scolopendra, 228
Phosphorius, a species of elater, 166
Phryganea, 195
Pilularius, a species of scarabæus, 153
Pimelia, 168
Pincers, 147
Pinguinalis, a species of phalæna, sometimes found in the human stomach, 193
Pinnophylax, a species of cancer, 224
Pipiens, a species of culex, 213
Pisè, a species of bruchus, introduced into Europe from America, 159
Plant-lice, 179
Plebeii, a division of papilio, 183, 187
Pneumora, 171
Podura, 215
Polonicus, a species of coccus, 176
Polyphemus, a species of monoculus, 227
Prawn, 225
Preservation of insects in cabinets, 236
Pterophori, a division of phalæna, 190, 194
Ptinus, 155
Pubis, a species of pediculus, 218
Pulex, 219
 a species of monoculus, 227
Pulsatorius, a species of termes, 218
Pumilionis, a species of musca, 212
Pyatides, a division of phalæna, 189, 193
- Q
- Queen bee*, 203
Quercus gemmæ, species of cynips, 197
foliæ, *ib.*
- R
- Raphidia*, 197
- Red spider*, p. 219
Rein-deer go to the mountains to flum the œstrus, 208
Renagrida, a kind of cochineal, 177
Respiration of insects, 232
Reversed, 146
Rhamnus jujuba, food of the lac insect, 180
Rhinomacer, 161
Robinæ, a species of bruchus, introduced into Europe from America, 159
Rosmarini, a species of cynips, 197
Rostrata, a species of stomoxys, 214
Rove-beetle, 157
Rurales, a subdivision of papilio, 170
Ruricolæ, a species of cancer, 224
- S
- Sabulosa*, a species of sphex, 200
Saccharinum, a species of lepidema, 215
Sanguisugus, species of acarus, 220
Saw-fly, 197
Scabiei, a species of acarus, 220
Scarabæus, 152
Schæfferi, a species of scarabæus, 153
Scarlet grain of Poland, 176
Scolia, 201
Scolopendra, 228
Scorpio, 223
Scorpion, 221
Scorpion fly, 196
Scutellum, 146
Secalis, a species of phalæna, 193
Secretion of insects, 233
Seductor, a species of ichneumon, 199
Segetis, a species of elater, 166
 a species of curculio, destructive to grain, 161
Senses of insects, 229
Serropalpus, 165
Setaceous, 146
Sexes of insects, 147
Shanks, *ib.* 221
Shepherd's spider, 225
Shrimp, 191
Silk, by whom first made, *ib.* 202
Silk-worm, 198
Sirex, 146
Siro, a species of acarus, 165
Skipper, 146
Snout, 171
Soothsayer, a species of mantis, 169
Spanish fly, 166
Sparkler, 200
Sphex, 187
Sphinx, 221
Spider, 146
Spiracula, 164
Splendidula, a species of lampyrus, 215
Spring-tail, 173
Spumaria, a species of cicada, 225
Squilla, a species of cancer, 154
Stag-beetle, 170
Staphilinus, 170
- State* of the atmosphere most favourable for the secretion of honey, p. 205
Stemmata, 146
Sternum, *ib.* 147
Sting, of the European scorpion not so dangerous as is commonly supposed, 223
Stipitati, 146
Stomoxys, 214
Stricata, a species of pimelia, 169
Sycophanta, a species of carabus, 168
Sypha, 156
Sylvester, a species of cochineal, 177
- T
- Tabanus*, 213
Tail, 147
Tailed wasp, 198
Tapezella, a species of phalæna, 194
Tarandi, a species of œstrus, 208
Tarantula, a species of aranea, 222
Telarius, a species of acarus, 219
Tenebrio, 168
Tenthredo, 197
Termes, 215
Terrestris, a species of apis, 206
Tetra-scale cochineal, 177
Thorax, 146
Thrips, 182
Thynnus, 201
Tick, 219
Tinea, a division of phalæna, 190, 192
Tipha, 201
Tipula, 210
Tortrices, a division of phalæna, 190
Tritici, a species of phalæna, 194
 a species of tipula, 210
Tritoma, 156
Troes, a subdivision of papilio, 183
Trompe, a species of œstrus, 208
Trunk, 146
Turnip-fly, 158
- V
- Verrucivorus*, a species of gryllus, 172
Vesicatoria, a species of lytta, 169
Vespa, 202
Vitellinæ, a species of tenthredo, 198
Vine-fretter, 175
Violacea, a species of apis, 206
Vitis, a species of aphid, 176
Vocans, a species of cancer, 224
Vulgaris, a species of vespa, 202
Vulgata, a species of ephemera, used as manure by the inhabitants of Carniola, 195
Urbicola, a subdivision of papilio, 183, 187
Urticæ, a species of papilio, 186
Use the bees make of the farina of flowers, 205
Utility of insects, 235
- W
- Warbles*, 208
Wasp, 202
Water-clock,

Water-clock,
Water-flea,
Water-scorpion,
Wax formed from honey,
making bees,
Weevil,

p. 167 Whirler,
155 Wings,
174 erect,
203 deflected,
204 White ant,
160 eaten by the Africans,

p. 155
146
ib.
ib.
215
216

Y
Youngest and most vigorous cattle at-
tacked by the breeze, p. 208
Z
Zigia, 160
Zonitis, ib.

E N T

Entrepas
||
Entry.

ENTREPAS, in the manege, a broken pace or going, that is neither walk nor trot, but has somewhat of an amble.

This is a pace or gait of such horses as have no reins or back, and go upon their shoulders; or, of such as are spoiled in their limbs.

ENTRING LADDERS, in a ship, are of two sorts; one used by the vessel's sides, in a harbour, or in fair weather, for persons to go in and out of the ship: the other is made of ropes, with small staves for steps; and is hung out of the gallery to enter into the boat, or to come aboard the ship, when the sea runs so high that they durst not bring the boat to the ship's side for fear of flaving it.

ENTROCHUS, in *Natural History*, a genus of extraneous fossils, usually of about an inch in length, and made up of a number of round joints, which, when separate and loose, are called *trochite*: they are composed of the same kind of plated spar with the fossil shells of the echini, which is usually of a bluish-gray colour, and very bright where fresh broken; they are all striated from the centre to the circumference, and have a cavity in the middle.

The entrochi are found of all sizes, from that of a pin's head to a finger's length, and the thickness of one's middle finger; and are plainly of marine origin, having often sea-shells adhering to them. They seem to be the petrified arms of that singular species of the sea star-fish, called *stella arborefcens*.

ENTRY, in *Law*, signifies taking possession of lands or tenements, where a person has a right so to do.

ENTRY of an Heir, in *Scots Law*, that form of law by which an heir vests in himself a proper title to his predecessor's estate.

Bill of ENTRY, in commerce. See BILL.

In making entries inwards, it is usual for merchants to include all the goods they have on board the same ship in one bill, though sometimes they may happen to be upwards of 20 several kinds: and in case the goods are short entered, additional or post entries are now allowed; though formerly the goods so entered were forfeited. As to bills of entry outwards, or including goods to be exported, upon delivering them, and paying the customs, you will receive a small piece of parchment called a *cocket*, which testifies your payment thereof, and all duties for such goods.

If several sorts of goods are exported at once, of which some are free, and others pay customs; the exporter must have two cockets, and therefore must make two entries; one for the goods that pay, and the other for the goods that do not pay custom.

Entries of goods, on which a drawback is allowed, must likewise contain the name of the ship in which the

E O N

Envelope
||
Eonians.

goods were imported, the importer's name, and time of entry inwards. The entry being thus made, and an oath taken that the customs for those goods were paid as the law directs, you must carry it to the collector and comptroller, or their deputies; who, after examining their books, will grant warrant, which must be given to the surveyor, searcher, or land-waiter, for them to certify the quantity of goods; after which the certificate must be brought back to the collector and comptroller, or their deputies, and oath made that the said goods are really shipped, and not landed again in any part of Great Britain.

ENVELOPE, in *Fortification*, a work of earth, sometimes in form of a simple parapet, and at others like a small rampart with a parapet: it is raised sometimes on the ditch, and sometimes beyond it.

ENVIRONNE', in *Heraldry*, signifies surrounded with other things: thus, they say, a lion environné with so many bezants. See BEZANTS.

ENUMERATION, an account of several things, in which mention is made of every particular article.

ENUMERATION, in *Rhetoric*, a part of peroration; in which the orator, collecting the scattered heads of what has been delivered throughout the whole, makes a brief and artful relation or recapitulation thereof.

ENVOY, a person deputed to negotiate some affair with any foreign prince or state. Those sent from the courts of Britain, France, Spain, &c. to any petty prince or state, such as the princes of Germany, the republics of Venice, Genoa, &c. go in quality of envoys, not ambassadors; and such a character only do those persons bear, who go from any of the principal courts of Europe to another, when the affair they go upon is not very solemn or important. There are envoys ordinary and extraordinary, as well as ambassadors; they are equally under the protection of the law of nations, and enjoy all the privileges of ambassadors; only differing from them in this, that the same ceremonies are not performed to them.

ENVY, in *Ethics*, pain felt, and malignity conceived, at the sight of excellence or happiness in another. See EMULATION.

EON, or ÆON. See ÆON.

EONIANS, in church-history, the followers of Eon, a wild fanatic of the province of Bretagne, in the 12th century, whose brain was disordered. He concluded from the resemblance between *eum*, in the form for exorcising malignant spirits, viz. *Per eum, qui venturus est judicare vivos et mortuos*, and his own name Eon, that he was the son of God, and ordained to judge the quick and dead. Eon, however, was solemnly condemned by the council at Rheims, in 1148, at which Pope Eugenius III. presided, and ended his days in a

Eoria
||
Epacts.

miserable prison. He left behind him a number of followers and adherents, whom persecution and death so weakly and cruelly employed could not persuade to abandon his cause, or to renounce an absurdity which, says Mosheim, one would think could never have gained credit but in such a place as Bedlam.

EORIA, in *Mythology*, a feast celebrated by the Athenians in honour of Erigonus, who, by way of punishment for their not avenging the death of his father Icarus, engaged the gods to inflict the curse on their daughters that they should love men who never returned their passion. The feast was instituted by the order of Apollo.

EOSTRE, in *Mythology*, a Saxon goddess to whom they sacrificed in the month of April, called the month of *Eostra*; and thence the name *Easter*, which the Saxons retained after their conversion to Christianity, applying it to the festival celebrated in commemoration of our Saviour's resurrection.

EPACRIS, a genus of plants belonging to the pentandria class. See *BOTANY Index*.

EPACTS, in *Chronology*, the excesses of the solar month above the lunar synodical month, and of the solar year above the lunar year of twelve synodical months; or of several solar months above as many synodical months, and several solar years above as many dozen of synodical months.

The epacts, then, are either *annual* or *menstrual*.

Menstrual epacts are the excesses of the civil or kalendar month above the lunar month. Suppose, e. g. it were new moon on the first day of January; since the lunar month is 29 days 12h. 44' 3", and the month of January contains 31 days, the menstrual epact is 1 day 11h. 15' 57".

Annual epacts are the excesses of the solar year above the lunar. Hence, as the Julian solar year is 365 days 6h. and the Julian lunar year 354 days 8h. 48' 38", the annual epact will be 10 days 21h. 11' 22"; that is, nearly 11 days. Consequently the epact of 2 years is 22 days; of 3 years, 33 days; or rather 3, since 30 days make an *embolismic* or intercalary month.

Thus the epact of 4 years is 14 days, and so of the rest; and thus, every 19th year, the epact becomes 30 or 0; consequently the 20th year the epact is 11 again; and so the cycle of epacts expires with the golden number, or lunar cycle of 19 years, and begins with the same, as in the following table:

Gold. Numb.	Epacts.	Gold. Numb.	Epacts.	Gold. Numb.	Epacts.
1	XI	8	XXVIII	14	IV
2	XXII	9	IX	15	XV
3	III	10	XX	16	XXVI
4	XIV	11	I	17	VIII
5	XXV	12	XII	18	XIX
6	VI	13	XXIII	19	XXX
7	XVII				

Again, as the new moons are the same, that is, as they fall on the same day every 19 years, so the difference between the lunar and solar years is the same

every 19 years. And because the said difference is always to be added to the lunar year, in order to adjust or make it equal to the solar year; hence the said difference respectively belonging to each year of the moon's cycle is called the *epact* of the said year, that is, the number to be added to the said year, to make it equal to the solar year; the word being formed from the Greek *επαγω*, *induco*, *intercolo*.

Upon this mutual respect between the cycle of the moon and the cycle of the epacts, is founded this rule for finding the Julian epact, belonging to any year of the moon's cycle. Multiply the year given of the moon's cycle into 11: and if the product be less than 30, it is the epact sought; if the product be greater than 30, divide it by 30, and the remainder of the dividend is the epact. For instance, I would know the epact for the year 1712, which is the third year of the moon's cycle. Wherefore 3 is the epact for 1712; for $11 \times 3 = 33$, and 33 being divided by 30, there is left 3 of the dividend for the epact. But the difference of the Julian and Gregorian years being equal to the excess of the solar above the lunar year, or 11 days, it happens that the Gregorian epact for one year is the same with the Julian epact for the preceding year.

EPAMINONDAS, a celebrated Theban, the son of Polymnus, and one of the greatest captains of antiquity. He learned philosophy and music under Lyfius, a Pythagorean philosopher; and was from his infancy inured to all the exercises of body and mind. He was learned, generous, well-skilled in war, brave, modest, and prudent; and had such a regard for truth, that he would not tell a falsehood even in jest. He served first under the Lacedemonians; saved the life of Pelopidas their chief, who received in a battle seven or eight wounds; and contracted a strict friendship with that general, which lasted till his death. At his persuasions, Pelopidas delivered the city of Thebes from the yoke of the Spartans, who had rendered themselves masters of Cadmea, which occasioned a bloody war between the two nations. Epaminondas was made general of the Thebans; on which he gained the celebrated battle of Leuctra, in which Cleombrotus, the valiant king of Sparta, was killed. He then ravaged the enemy's country, and caused the city of Mefima to be rebuilt and peopled. At length, the command of the army was given to another, because Epaminondas had kept his troops in the field four months longer than he had been ordered by the people; but, instead of retiring in disgust, he now served as a common soldier, and distinguished himself by so many brave actions, that the Thebans, ashamed of having deprived him of the command, restored him to his post, in order to carry the war into Theffaly, where his arms were always victorious. A war breaking out between the Elians and the inhabitants of Mantinea, the Thebans took the part of the former. Epaminondas then resolved to endeavour to surprize Sparta and Mantinea; but not succeeding, he gave the enemy battle, in which he received a mortal wound with a javelin, the bearded iron remaining in the wound. Knowing that it could not be drawn out without occasioning immediate death, he would not suffer it to be touched, but continued to give his orders: and on his being told, that the enemy were entirely defeated, "I have lived long enough (he cried),

Epaminon-
das.

Epanalepsis cried), since I die without being conquered;" and at the same time he plucked the javelin from his wound, and expired, 363 B. C.

EPANALEPSIS. See ORATORY, N° 73.

EPANODOS. *Ibid.* N° 75.

EPANORTHOSIS. *Ibid.* N° 75.

EPARER, in the manege, signifies the flinging of a horse, or his yerking and striking with his hind-legs.

EPAULEMENT, in *Fortification*, a work raised to cover sidewise, is either of earth, gabions, or fascines loaded with earth. The epaulements of the places of arms for the cavalry, at the entrance of the trenches, are generally of fascines mixed with earth.

EPAULETTES, are a kind of shoulder-knots chosen for the soldiers, which are to be of the colour of the facing, with a narrow yellow or white tape round it, and worsted fringe; those for the officers are made of gold or silver lace, with a rich fringe; they are badges of distinction worn on one or both shoulders. Those of the dragoon-guards, horse, and dragoons, are worn on the left shoulder: the light dragoons, and officers of grenadiers, have one on each shoulder: those of the battalion wear one on the right shoulder only, which is to be made of embroidery or lace with a gold or silver fringe. Those of the royal regiment of artillery are to be gold and embroidery, with gold fringe on scarlet cloth, and worn on the right shoulder.

EPENTHESIS, in *Grammar*, the interposition or insertion of a letter or syllable in the middle of a word; as *alium*, for *alium*; *reliigio*, for *religio*; *induperator*, for *imperator*, &c.

EPEUS, of the line of Endymion, the inventor of the battering ram, an engine of great service in sieges to make a breach. He is thought to have built the Trojan horse, and to have founded the city Metapontum.

EPHA, or ΕΡΗΑΗ, in Jewish antiquity, a measure for things dry, equal to 3 pecks and 3 pints.

EPHEBÆUM, in antiquity, the place where the ephēbi or youth exercised; or, as some say, where those who designed to exercise met, and agreed what kind of exercise they should contend in, and what should be the victor's reward.

EPHEBI, among the Athenians, a designation given to their young men when they arrived at 18 years of age, at which time they had their names entered in a public register.

EPHEDRA, a genus of plants, belonging to the diœcia class, and in the natural method ranking under the 51st order, *Coniferæ*. See BOTANY *Index*.

EPHEMERA, from ἐμεξα, "a day;" a diary fever, or a fever of one day's continuance only. In this case, such a heat as attends an excess of wine, a pulse somewhat full and quick, but soft and regular, a slight headach, a nausea, and restlessness, are all the symptoms, and which terminate without any sensible evacuation. If it continue unto the third day, it is not a diary fever; and if the constitution is very dry, a hectic is to be dreaded.

EPHEMERA, the *Day-fly*, a genus of insects belonging to the order of neuroptera. See ENTOMOLOGY *Index*.

EPHEMERIDES, in *Astronomy*, tables calculated

by astronomers, showing the present state of the heavens for every day at noon; that is, the places wherein all the planets are found at that time. It is from these tables that the eclipses, conjunctions, and aspects of the planets, are determined; horoscopes or celestial schemes constructed, &c. We have ephemerides of Origan, Kepler Argoli, Heckerus, Mezzarachis, Wing, De la Hire, Parker, &c. S. Cassini has calculated ephemerides of the sidera medicæ or satellites of Jupiter, which are of good use in determining the longitude.

In England, the Nautical Almanack, or Astronomical Ephemeris, published annually by anticipation, under the direction of the commissioners of longitude, is the most considerable. In France, celestial ephemerides have been published by M. Desplaces every ten years, from 1715 to 1745; they were afterwards continued by the Abbé Caille, with many additions; of which an account may be seen in the History of the Academy of Sciences for 1743. The Academy of Sciences have likewise published annually, from the beginning of the present century, a kind of ephemeris under the title of *Connoissance des Temps*.

EPHESUS, a city of antiquity, much celebrated on account of its temple of Diana, and for being the most famous mart or staple town of Hither Asia. Ephesus was in ancient times the metropolis of all Asia. Stephanus gives it the title of *Epiphaneſtates*, or *most illustrious*; and Pliny styles it the ornament of Asia. The ancient city stood about 50 miles south of Smyrna, near the mouth of the river Cayster, and the shore of the Icarian sea, which is a bay of the Ægean; but as it has been so often destroyed and rebuilt, it is no easy matter to determine the precise place. Most of our modern travellers are of opinion, that the ancient city stood more to the south than the present; which they argue from the ruins that still remain. Ephesus was, in ancient times, known by the names of *Alopes*, *Ortygia*, *Morges*, *Smyrna*, *Trachæa*, *Samornion*, and *Ptelo*. It was called *Éphesus*, according to Heraclides, from the Greek word *epheſus*, signifying *permission*; because Hercules (says he) permitted the Amazons to live and build a city in that place. Others tell us, that Ephesus was the name of the Amazon that founded the city; for Pliny, Justin, and Orosius, unanimously affirm that it was built by an Amazon; while others bestow this honour upon Androclus, the son of Codrus king of Athens, who was the chief of the Ionians that settled in Asia. But in matters of so early a date, it is impossible to come at the truth, and therefore not worth our while to dwell on such fruitless inquiries. What we know for certain is, that the city, which in the Roman times was the metropolis of all Asia, acknowledged Lyſimachus for its founder; for that prince, having caused the ancient city to be entirely demolished, rebuilt, at a vast expence, a new one, in a place more convenient, and nearer the temple. Strabo tells us, that, as the inhabitants showed a great reluctance to quit their ancient habitations, Lyſimachus caused all the drains that conveyed the water into the neighbouring fens and the Cayster to be privately stopped up; whereby the city being on the first violent rains in great part laid under water, and many of the inhabitants drowned, they were glad to abandon the ancient and retire

Ephesus.

Ephesus. retire to the new city. This new Ephesus was greatly damaged by an earthquake in the reign of Tiberius, but by that emperor repaired and adorned with several stately buildings, of which there are now but few ruins to be seen, and scarce any thing worthy of ancient Ephesus. The aqueduct, part of which is still standing, is generally believed to have been the work of the Greek emperors; the pillars which support the arches are of fine marble, and higher or lower as the level of the water required. This aqueduct served to convey water into the city from the spring of Halites, mentioned by Pausanius. The gate, now called by the inhabitants, for what reason we know not, *the Gate of Persecution*, is remarkable for three bas-reliefs on the mould of an exquisite taste. The port, of which so many medals have been struck, is at present but an open road, and not much frequented. The Cayster was formerly navigable, and afforded a safe place for ships to ride in, but is now almost choked up with sand.

But the chief ornament of Ephesus was the temple of Diana, built at the common charge of all the states in Asia, and for its structure, size, and furniture, accounted among the wonders of the world. This great edifice was situated at the foot of a mountain, and at the head of a marsh; which place they chose, if we believe Pliny, as the least subject to earthquakes. This site doubled the charges; for they were obliged to be at a vast expence in making drains to convey the water that came down the hill into the morass and the Cayster. Philo Byzantius tells us, that in this work they used such a quantity of stone, as almost exhausted all the quarries in the country; and these drains or vaults are what the present inhabitants take for a labyrinth. To secure the foundations of the conduits or sewers, which were to bear a building of such a prodigious weight, they laid beds of charcoal, says Pliny, well rammed, and upon them others of wool. Two hundred and twenty years, Pliny says 400, were spent in building this wonderful temple by all Asia. It was 425 feet in length, and 200 in breadth, supported by 127 marble pillars, 70 feet high, of which 27 were most curiously carved, and the rest polished. These pillars were the works of so many kings, and the bas-reliefs of one were done by Scopas, the most famous sculptor of antiquity; the altar was almost wholly the work of Praxiteles. Cheiomocrates, who built the city of Alexandria, and offered to form Mount Athos into a statue of Alexander, was the architect employed on this occasion. The temple enjoyed the privilege of an asylum, which at first extended to a furlong, was afterwards enlarged by Mithridates to a bow shot, and doubled by Mark Antony, so that it took in part of the city: but Tiberius, to put a stop to the many abuses and disorders that attend privileges of this kind, revoked them all, and declared, that no man guilty of any wicked or dishonest action should escape justice, though he fled to the altar itself.

The priests who officiated in this temple were held in great esteem, and trusted with the care of sacred virgins, or priestesses, but not till they were made eunuchs. They were called *Estiatores* and *Esseneæ*, had a particular diet, and were not allowed by their constitutions to go into any private house. They were maintained with the profits accruing from the lake Selinusis, and another that fell into it, which must have

been very considerable, since they erected a golden statue to one Artemidorus, who being sent to Rome, recovered them after they had been seized by the farmers of the public revenues. All the Ionians resorted yearly to Ephesus with their wives and children, where they solemnized the festival of Diana with great pomp and magnificence, making on that occasion rich offerings to the goddess, and valuable presents to her priests. The *Asiarchæ*, mentioned by St Luke, were, according to Beza, those priests whose peculiar province it was to regulate the public sports that were annually performed at Ephesus in honour of Diana: they were maintained with the collections made during the sports; for all Asia flocked to see them. The great Diana of the Ephesians, as she was styled by her blind adorers, was, according to Pliny, a small statue of ebony, made by one Canitia, though commonly believed to have been sent down from heaven by Jupiter. This statue was first placed in a niche, which, as we are told, the Amazons caused to be made in the trunk of an elm. Such was the first rise of the veneration that was paid to Diana in this place. In process of time the veneration for the goddess daily increasing among the inhabitants of Asia, a most stately and magnificent temple was built near the place where the elm stood, and the statue of the goddess placed in it. This was the first temple; but not quite so sumptuous as that which we have described, though reckoned, as well as the second, among the wonders of the world. The second, being that above described, was remaining in Pliny's time, and in Strabo's; and is supposed to have been destroyed in the reign of Constantine, pursuant to the edict by which that emperor commanded all the temples of the heathens to be thrown down and demolished: the former was burnt the same day that Alexander was born, by one Erostratus, who owned on the rack, that the only thing which had prompted him to destroy so excellent a work, was the desire of transmitting his name to future ages. Whereupon the common council of Asia made a decree, forbidding any one to name him; but this prohibition served only to make his name more memorable, such a remarkable extravagance, or rather madness, being taken notice of by all the historians who have written of those times. Alexander offered to rebuild the temple at his own expence, provided the Ephesians would agree to put his name on the front; but they rejected his offer in such a manner as prevented the resentment of that vain prince, telling him, that "it was not fit one god should build a temple to another." The pillars, and other materials that had been saved out of the flames, were sold, and also the jewels of the Ephesian women, who on that occasion willingly parted with them; and the sum raised from thence served for the carrying on of the work till other contributions came in, which in a short time amounted to an immense treasure. This is the temple which Strabo, Pliny, and other Roman writers speak of. It stood between the city and the port, and was built, or rather finished, as Livy tells us, in the reign of King Servius. Of this wonderful structure there is nothing at present remaining but some ruins, and a few broken pillars.

The Ionians first settled at Ephesus under the conduct of Androclus, who drove out the Carians and Leleges, by whom those places were possessed at his arrival.

Ephesus.

rival. The city, whether built by him, as Strabo affirms, or by Cræsus or Ephesus, long before the Ionic migration, as others maintain, became soon the metropolis of Ionia. It was at first governed by Androclus, and his descendants, who assumed the royal title, and exercised the regal authority over the new colony: whence, even in Strabo's time, the posterity of Androclus were styled kings, and allowed to wear a scarlet robe, with a sceptre, and all the ensigns of the royal dignity. In process of time, a new form of government was introduced, and a senate established; but when, or on what occasion, this change happened, we know not. This kind of government continued till the time of Pythagoras, who lived before Cyrus the Great, and was one of the most cruel and inhuman tyrants we read of in history; for having driven out the senate, and taken all the power into his own hands, he filled the city with blood and rapine, not sparing even those who fled to the temple of Diana for shelter. Pythagoras was succeeded by Pindarus, who bore the same sway in the city; but treated the citizens with more humanity. In his time Ephesus being besieged by Cræsus king of Lydia, he advised the inhabitants to devote their city to Diana, and fasten the wall, by a rope, to the pillars of her temple. They followed his advice, and were, from reverence to the goddess, not only treated with great kindness by Cræsus, but restored to their former liberty. Pindarus being obliged to resign his power, retired to Peloponnesus. He was, according to Ælian, grandson to Alyattes king of Lydia, and Cræsus's nephew. The other tyrants of Ephesus mentioned in history are, Athenagoras, Comes, Aristarchus, and Hegesias; of whom the last was expelled by Alexander, who, coming to Ephesus, after having defeated the Persians on the banks of the Granicus, bestowed upon Diana all the tributes which the Ephesians had paid to the Persians, and established a democracy in the city. In the war between Mithridates and the Romans, they sided with the former, and, by his directions, massacred all the Romans that resided in their city; for which barbarity they were severely fined, and reduced almost to beggary by Sylla, but afterwards treated kindly, and suffered to live according to their own laws, as is plain from several ancient inscriptions and medals. The Ephesians were much addicted to superstition, sorcery, and curious arts, as the scripture styles them: whence came the proverb "Ephesian letters," signifying all sorts of spells or charms.

In the time of the apostle Paul, Ephesus retained a great deal of its ancient grandeur. But it was a ruinous place, when the emperor Justinian filled Constantinople with its statues, and raised his church of St Sophia upon its columns. Since then it has been almost quite exhausted. Towards the end of the 11th century, a Turkish pirate, named *Tangripermes*, settled there. But the Greek admiral, John Ducas, defeated him in a bloody battle, and pursued the flying Turks up the Meander. In 1306, it was among the places which suffered from the exactions of the grand-duke Roger; and two years after, it surrendered to Sultan Sayfan, who, to prevent future insurrections, removed most of the inhabitants to Tyræum, where they were massacred. Ephesus appears to have subsisted as an inconsiderable

place for some time. But now, the Ephesians are only a few Greek peasants, living in extreme wretchedness, dependence, and insensibility; the representatives of an illustrious people, and inhabiting the wreck of their greatness; some, the substructions of the glorious edifices which they raised; some, beneath the vaults of the stadium, once the crowded scene of their diversions; and some, by the abrupt precipice, in the sepulchres which received their ashes.

EPHETÆ (from *εφημι*, "I send forth"), in antiquity, a sort of magistrates among the Athenians, instituted by King Demophoon, to take cognizance of murder, manslaughter, and chance-medley.

Their number was 100, whereof 50 were Athenians, and 50 Argians: they were not admitted to the post till upwards of 50 years of age. Draco new-modelled it, excluded the Argians out of it, and made it to consist of 51 Athenians, each above 50 years of age: Ubbø Emmius de Rep. Athen. says, he transferred to them part of the jurisdiction of the Areopagites. See AREOPAGUS.

EPHOD, in Jewish antiquity, one part of the priestly habit; being a kind of girdle, which, brought from behind the neck over the two shoulders, and hanging down before, was put across the stomach, then carried round the waist, and made use of as a girdle to the tunic.—There were two sorts of ephods, one of plain linen for the priests, and the other embroidered for the high-priest.

EPHORI, in Grecian antiquity, magistrates established in ancient Sparta to balance the regal power. The authority of the ephori was very great. They sometimes expelled and even put to death the kings, and abolished or suspended the power of the other magistrates, calling them to account at pleasure. There were five of them, others say nine. They presided in the public shows and festivals. They were entrusted with the public treasure; made war and peace; and were so absolute, that Aristotle makes their government equal to the prerogative of a monarchy. They were established by Lycurgus, according to the generality of authors: though this is denied by others, who date their origin 130 years after the time of that legislator. Thus Plutarch, in his Life of Cleomenes, ascribes their institution to Theopompus king of Sparta; which is also confirmed by the authority of Aristotle.

EPHORUS, an orator and historian of Cumæ in Æolia, about 352 years before Christ. He was disciple to Isocrates, by whose advice he wrote a history which gave an account of all the actions and battles that had happened between the Greeks and barbarians for 750 years. It was greatly esteemed by the ancients; but is now lost.

EPHRAIM, in *Ancient Geography*, one of the divisions of Palestine by tribes: Ephraim and the half tribe of Manasseh are blended together by the sacred writer; and it only appears that Ephraim occupied the more southern, and the half tribe of Manasseh the more northern parts, but both seem to have extended from the Jordan to the sea. Ephraim also denotes a kingdom, on the separation of the 10 tribes from the house of David, called also the kingdom of Israel and of Samaria.

EPHRATA,

Ephetæ
||
Ephraim.

Ephrata
||
Epicedon.

EPHRATA, a small town of Pennsylvania in America, and the principal settlement of the religious sect called *Dunkards* or *Tunkers*. See **TUNKERS**.

EPHYREM, SYRUS, an ancient Christian writer, in the fourth century, deacon of Edessa, was born at Nisibe in Syria. He was greatly esteemed by St Basil, St Gregory, Nyssen, and other great men. He wrote against the opinions of Sabellius, Arius, Apollonarius, the Manichees, &c. and acquired such reputation by his virtue and his works, that he was called the *doctor and the prophet of the Syrians*. He died in 378. The best editions of his works are, that of Oxford, in 1708, in folio, and that of Rome, from 1732 to 1738, in Syriac, Greek, and Latin, 6 vols folio.

EPHYDOR, in antiquity, an officer in the Athenian courts of justice, who was to provide the plaintiff and defendant with equal water hour-glasses. When the glass was run out, they were not permitted to speak any farther; and, therefore, we find them very careful not to lose or mispend one drop of their water. Whilst the laws quoted by them were reciting, or if any other business happened to intervene, they gave orders that the glass should be stopped.

EPIBATÆ, *Ἐπιβάται*, among the Greeks, marines, or soldiers who served on board the ships of war. They were armed in the same manner as the land-forces, only that more of them wore full or heavy armour.

EPIBATERION, a poetical composition, in use among the ancient Greeks. When any person of condition and quality returned home after a long absence or journey into another country, he called together his friends and fellow-citizens, and made them a speech, or rehearsed them a copy of verses, wherein he returned solemn thanks to the immortal gods for his happy return; and ended with an address by way of compliment to his fellow-citizens.—These verses made what the Greeks call *ἐπιβατήριον*, *epibaterium*, of *ἐπιβαίνω*, "I go abroad." At going away they had another, called *apobaterium*.

EPIBATERIUM, a genus of plants belonging to the monoecia class. See **BOTANY Index**.

EPIC, or HEROIC, *Poem*, a poem expressed in narration, formed upon a story partly real and partly feigned; representing, in a sublime style, some signal and fortunate action, distinguished by a variety of great events, to form the morals, and affect the mind with the love of heroic virtue.

We may distinguish three parts of the definition, namely, the matter, the form, and the end. The matter includes the action of the fable, under which are ranged the incidents, episodes, characters, morals, and machinery. The form comprehends the way or manner of the narration, whether by the poet himself, or by any persons introduced, whose discourses are related: to this branch likewise belong the moving of the passions, the descriptions, discourses, sentiments, thoughts, style, and versification; and besides these, the similes, tropes, figures, and, in short, all the ornaments and decorations of the poem. The end is to improve our morals and increase our virtue. See **POETRY**.

EPICEDON (formed of *ἐπι upon*, and *κνδος funeral*), in the Greek and Latin poetry, a poem, or poetical composition, on the death of a person.—At the obsequies of any man of figure, there were three kinds of discourses usually made; that rehearsed at his

burial or funeral pile, was called *nenia*; that engraven upon his tomb, *epitaph*; and that spoken in the ceremony of his funeral, *epicedion*. We have two beautiful epicedions in Virgil, that of Euryalus and that of Pallas.

EPICEDIUM, in ancient poetry, a poem rehearsed during the funeral solemnity of persons of distinction.

EPICCHARMUS, an ancient poet and philosopher, born in Sicily, was a scholar of Pythagoras. He is said to have introduced comedy at Syracuse in the reign of Hiero. Horace commends Plautus for imitating him, in following the chase of the intrigue so closely as not to give the readers or spectators time to trouble themselves with doubts concerning the discovery. He wrote likewise treatises concerning philosophy and medicine; but none of his works have been preserved. He died aged 90, according to Laertius, who has preserved four verses inscribed on his statue.

EPICHIROTONIA, among the Athenians. It was ordained by Solon, that once every year the laws should be carefully revised and examined; and if any of them were found unsuitable to the present state of affairs, they should be repealed. This was called *ἐπιχειροτονια των νομων*, from the manner of giving their suffrages by *holding up their hands*. See a farther account of this custom in Pott. *Archæol. Græc. lib. 1. cap. 26. tom. i. p. 242*.

EPICOENE, in *Grammar*, a term applied to nouns, which, under the same gender and termination, mark indifferently the male and female species. Such in Latin is *aquila*, *vespertilio*, &c. which signify equally a male or female eagle or bat.

Grammarians distinguish between *epicæne* and *commarians*. A noun is said to be common of two kinds, when it may be joined either with a masculine or a feminine article; and epicæne, when it is always joined to some of the two articles, and yet signifies both genders.

EPICLETUS, a celebrated Stoic philosopher, born at Hierapolis in Phrygia, in the first century, was the slave of Epaphroditus, a freedman and one of Nero's guard. Domitian banishing all philosophers from Rome, about the year 94, Epictetus retired to Nicopolis in Epirus, where he died in a very advanced age; and after his death, the earthen lamp he made use of sold for 3000 drachmas. He was a man of great modesty; which was eminent in his own practice, as well as in his recommendation to others: hence he used to say, "That there is no need of adorning a man's house with rich hangings or paintings, since the most graceful furniture is temperance and modesty, which are lasting ornaments, and will never be the worse for wearing." Of all the ancient philosophers, he seems to have made the nearest approaches to the Christian morality, and to have had the most just ideas of God and providence. He always possessed a cool and serene mind, unruffled by passion; and was used to say, that the whole of moral philosophy was included in these words, *support and abstain*. One day, his master Epaphroditus strove in a frolic to wrench his leg; when Epictetus said, with a smile, and free from any emotion, "If you go on, you will certainly break my leg:" but the former redoubling his effort, and striking it with all his strength, he at last broke the bone; when all the return Epictetus made was, "Did

Epicurean Philosophy. "Did not I tell you, Sir, that you would break my leg?" No man was more expert at reducing the rigour of the maxims of the Stoics into practice. He conformed himself strictly, both in his discourse and behaviour, to the manners of Socrates and Zeno. He waged continual war with fancy and fortune; and it is an excellence peculiar to himself, that he admitted all the severity of the Stoics without their frowns, and reformed Stoicism as well as professed it; and besides his vindicating the immortality of the soul as strenuously as Socrates or any Stoic of them all, he declared openly against self-murder, the lawfulness of which was maintained by the rest of the sect. Arrian, his disciple, wrote a large account of his life and death, which is lost; and preserved four books of his discourses and his Enchiridion, of which there have been several editions in Greek and Latin; and, in 1758, a translation of them into English was published by the learned and ingenious Miss Carter.

EPICUREAN PHILOSOPHY, the doctrine or system of philosophy maintained by Epicurus and his followers.

His philosophy consisted of three parts; canonical, physical, and ethereal. The first was about the canons or rules of judging. The censure which Tully passes upon him for his despising logic, will hold true only with regard to the logic of the Stoics, which he could not approve of, as being too full of nicety and quirk. Epicurus was not acquainted with the analytical method of division and argumentation, nor was he so curious in modes and formation as the Stoics. Soundness and simplicity of sense, assisted with some natural reflections, was all his art. His search after truth proceeded only by the senses; to the evidence of which he gave so great a certainty, that he considered them as an infallible rule of truth, and termed them the *first natural light of mankind*.

In the second part of this philosophy he laid down atoms, space, and gravity, as the first principles of all things: he did not deny the existence of God, but thought it beneath his majesty to concern himself with human affairs: he held him a blessed immortal Being, having no affairs of his own to take care of, and above meddling with those of others.

As to his ethics, he made the supreme good of man to consist in pleasure, and consequently supreme evil in pain. Nature itself, says he, teaches us this truth; and prompts us from our birth to procure whatever gives us pleasure, and avoid what gives us pain. To this end he proposes a remedy against the sharpness of pain: this was to divert the mind from it, by turning our whole attention upon the pleasures we have formerly enjoyed. He held that the wise man must be happy as long as he is wise; the pain, not depriving him of his wisdom, cannot deprive him of his happiness.

There is nothing that has a fairer show of honesty than the moral doctrine of Epicurus. Gassendus pretends, that the pleasure in which this philosopher has fixed the sovereign good, was nothing else but the highest tranquillity of mind, in conjunction with the most perfect health of body: but Tully, Horace, and Plutarch, as well as almost all the fathers of the church, give us a very different account of it: indeed the nature of this pleasure, in which the chief happiness is supposed to be seated, is a grand problem in the mo-

VOL. VIII. Part I.

als of Epicurus. Hence there were two kinds of Epicureans, the rigid and the remiss: the first were those who understood Epicurus's notion of pleasure in the best sense, and placed all their happiness in the pure pleasures of the mind, resulting from the practice of virtue: the loose or remiss Epicureans, taking the words of that philosopher in a gross sense, placed all their happiness in bodily pleasures or debauchery.

EPICURUS, the greatest philosopher of his age, was born at Gargettium in Attica, about 340 B. C. in the 109th Olympiad. He settled at Athens in a fine garden he had bought; where he lived with his friends in great tranquillity; and educated a great number of disciples. They lived all in common with their master. The respect which his followers paid to his memory is admirable: his school was never divided, but his doctrine was followed as an oracle. His birth-day was still kept in Pliny's time; the month he was born in was observed as a continual festival; and they placed his picture everywhere. He wrote a great many books, and valued himself upon making no quotations. He raised the atomical system to a great reputation, though he was not the inventor of it, but had only made some change in that of Democritus. As to his doctrine concerning the supreme good or happiness, it was very liable to be misrepresented, and some ill effects proceeded from thence, which discredited his sect. He was charged with perverting the worship of the gods, and inciting men to debauchery; but he did not forget himself on this occasion; he published his opinions to the whole world; he wrote some books of devotion; recommended the veneration of the gods, sobriety, and chastity; and it is certain that he lived in an exemplary manner, and conformably to the rules of philosophical wisdom and frugality. Timocritus, a deserter of his sect, spoke very scandalously of him. Gassendus has given us all he could collect from the ancients concerning the person and doctrine of this philosopher; who died of a suppression of urine, aged 72.

EPICYCLE, in the ancient astronomy, a little circle whose centre is in the circumference of a greater circle: or it is a small orb or sphere, which being fixed in the deferent of a planet, is carried along with it; and yet, by his own peculiar motion, carries the planet fastened to it round its proper centre.

It was by means of epicycles that Ptolemy and his followers solved the various phenomena of the planets, but more especially their stations and retrogradations.

EPICYCLOID, in *Geometry*, a curve generated by the revolution of the periphery of a circle, along the convex or concave side of the periphery of another circle.

EPICYEMA, among *Physicians*, denotes a superfetation; being a false conception or mole happening after the birth of a regular foetus.

EPIDAUURUM, **EPIDAUROS**, or **EPITAUURUM**, in *Ancient Geography*, a town of Dalmatia, on the Adriatic, built the same year, as is said, with Dyrrachium, 430 years after the destruction of Troy: a considerable town formerly, but now reduced to a small village, called *Ragusi Vecchio*; distant six miles from the modern Ragusi. E. Long. 19°. Lat. 42°. 20'.

EPIDAUROS, in *Ancient Geography*, a town of Argolis,

Epidaurus. Argolis, in Peloponnesus, on the Saronic bay, to the south of the promontory *Spiræum*; called *ſacred*, becauſe of the religious veneration paid to *Æſculapius*, whoſe temple ſtood at the diſtance of five miles from the town. The Romans, during a peſtilence, being adviſed to convey the god to Rome, ſent a ſhip, with a ſolemn embaſſy, for his conveyance; but while the Epidaurians were in ſuſpenſe to part with him, a huge ſerpent failed to the ſhip; and being taken for the god, was carried to Rome in great ſolemnity. Epidaurus ſtood in a recess of the bay, fronting the eaſt; and was fortified by nature, being incloſed by high mountains reaching to the ſea, and rendering it difficult of acceſs. It had ſeveral temples, and in the acropolis or citadel was a remarkable ſtatue of *Minerva*. The ſite is now called *Epi-thawro*. The traces are indiſtinct, and it has probably been long deſerted. The harbour of Epidaurus is long. Its periplus or circuit was 15 ſtadia or near two miles. The entrance is between mountains, and on a ſmall rocky peninſula on the left hand are ruins of a modern fortrefs. This, it ſeems, was the point on which a temple of *Juno* ſtood. It is frequented by veſſels for wood or corn. The grove of *Æſculapius* was incloſed by mountains, within which all the ſacrifices as well of the Epidaurians as of ſtrangers were conſumed. One was called *Tithion*; and on this the god when an infant was ſaid to have been expoſed, and to have been ſuckled by a ſhe-goat. He was a great phyſician, and his temple was always crowded with a ſick perſons. Beyond it was the dormitory of the ſuppliants; and near it, a circular edifice called the *Tholus*, built by *Polycletus*, of white marble, worth ſeeing. The grove, beſides other temples, was adorned with a portico, and a fountain remarkable for its roof and decorations. The bath of *Æſculapius* was one of the benefactions of *Antoninus Pius*, while a Roman ſenator; as was alſo a houſe for the reception of pregnant women and dying perſons, who before were removed out of the incloſure, to be delivered or to expire in the open air. The remains are heaps of ſtones, pieces of brick wall, and ſcattered fragments of marble; beſides ſome churches or rather piles of ruſh miſcalled, being deſtitute of doors, roofs, or any kind of ornament. The ſtatue of *Æſculapius* was half as big as that of *Jupiter Olympius* at Athens. It was made of ivory and gold, and, as the inſcription proved, by *Thraſymedes* ſon of *Arignotus* of *Paros*. He was represented ſitting, holding his ſtaff, with one hand on the head of a ſerpent, and a dog lying by him. Two Argive heroes, *Bellerophon* combating with the monſter *Chimæra*, and *Perſeus* ſevering the head of *Meduſa*, were carved on the throne. Many tablets deſcribed the cures performed by the deity, yet he had not eſcaped contumely and robbery. *Dionyſus* deprived him of his golden beard, affirming that it was unſeemly in him to appear in that manner when his father *Apollo* was always ſeen with his face ſmooth. *Sylla* amafſed the precious offerings belonging to him and to *Apollo* and *Jupiter* at *Delphi* and *Olympia*, to pay his army before Athens. The marks in the walls teſtified that a great number had been plucked down. A few fragments of white marble exquiſitely carved occur in the heap of the temple. The incloſure of the temple once abounded in inſcriptions. In the ſecond

century fix marbles remained, on which were written in the Doric dialect the names of men and women who had been patients of the god, with the diſtemper each had laboured under, and the remedies he had directed. Dr *Chandler* found only a couple of votive inſcriptions, and two pedeaſts of ſtatues, one of which represented a Roman, and was erected by the city of the Epidaurians. The ſtadium was near the temple. It was of earth, as moſt in Greece were. At the upper end are ſeats of ſtone, but theſe were continued along the ſides only a few yards. A vaulted paſſage leading underneath into the area, now choked up, was a private way by which the *Agonothetæ* or preſidents with the prieſts and perſons of diſtinction entered. Two large ciſterns or reſervoirs remain, made by *Antoninus* for the reception of rain water. Beyond them is a dry water-course; and in the mountain-ſide on the right hand are the marble ſeats of the theatre, overgrown with buſhes. The ſprings and wells by the ruins are now ſuppoſed to poſſeſs many excellent properties. To theſe and a good air, Dr *Chandler* thinks, with the recreations of the theatre and of the ſtadium, and to the medicinal knowledge and experience of the prieſts, may be attributed both the recovery of the ſick and the reputation of *Æſculapius*.

EPIDAUROS, with the ſurname *Limera*, to diſtinguiſh it from the Epidaurus of Argolis; called ſo, either from its meadows or its commodious harbours (*Stephanus*, *Apollodorus*): a town of Laconia, on the Ionian ſea, to the ſouth of the *Sinus Argolicus*, ſituated where now *Molvafia* ſtands, in the *Morea*. E. Long. 23. 30. Lat. 35. 40.

EPIDEMIA, in Grecian antiquity, feſtivals kept in honour of *Apollo* and *Diana*, at the ſtated ſeaſons, when thoſe cities, who could not be preſent every-where, were ſuppoſed to viſit diſſerent places, in order to receive the vows of their adorers.

EPIDEMIC, among phyſicians, an epithet of diſeaſes which at certain times are popular, attacking great numbers at or near the ſame time.

EPIDENDRUM, a genus of plants, belonging to the gynandria claſs; and in the natural method ranking under the ſeventh order, *Orchideæ*. See *BOTANY Index*.—This is the plant which produces the fruit called *vanilla*, and which is uſed in perfuming chocolate, tobacco, and ſnuff.

EPIDERMIS, in *Anatomy*, the cuticle or ſcarf-ſkin. See *ANATOMY Index*. The word is formed of the Greek *ἐπι, on, over*; and *δερμα, ſkin*.

EPIDICASIA, among the Athenians. Daughters inheriting their parents eſtate were obliged to marry their neareſt relation; which gave occaſion to perſons of the ſame family to go to law with one another, each pretending to be more nearly allied to the heiress than the reſt. The ſuit was called *ἐπιδικασίας δικη*: and the virgin, about whom the relations conteſted, *ἐπιδίκως*.

EPIDIDYMIS, in *Anatomy*, a little round body, on the back of each teſticle; called alſo *paraſtata*. See *ANATOMY Index*.

EPIGÆA, a genus of plants, belonging to the decandria claſs; and in the natural method ranking under the 18th order, *Bicornes*. See *BOTANY Index*.

EPIDOTÆ, certain deities who preſided over the growth

Epidaurus
||
Epidotæ.

Epigastric
||
Epigram. growth of children. They were worshipped by the Lacedæmonians, and chiefly invoked by those who were persecuted by the ghosts of the dead, &c.

EPIGASTRIC REGION, a part or subdivision of the abdomen. See ANATOMY *Index*.

EPIGLOTTIS, in *Anatomy*, one of the cartilages of the larynx or wind-pipe. See ANATOMY *Index*.

EPIGONI, the sons and descendants of the Grecian heroes who were killed in the first Theban war. The war of the Epigoni is famous in ancient history. It was undertaken ten years after the first. The sons of those who had perished in the first war, resolved to avenge the death of their fathers, and marched against Thebes, under the command of Thersander; or, according to others, of Alcmaon the son of Amphiaraus, about 1307 years before Christ. The Argives were assisted by the Corinthians, the people of Messenia, Arcadia, and Megara. The Thebans had engaged all their neighbours in their quarrel, as in one common cause. These two hostile armies met and engaged on the banks of the Glissas. The fight was obstinate and bloody, but victory declared for the Epigoni, and some of the Thebans fled to Illyricum with Leodamas their general, while others retired into Thebes, where they were soon besieged, and forced to surrender. In this war Ægialeus was the only one who was killed, and his father Adrastus was the only one who escaped alive in the first war. This whole war, as Pausanias observes, was written in verse; and Callinus, who quotes some of the verses, ascribes them to Homer, which opinion has been adopted by many writers: "For my part (continues the geographer), I own, that next to the Iliad and Odyssey of Homer, I have never seen a finer poem." The descendants of the veteran Macedonians, who served under Alexander the Great, and who had children by Asiatic women, were also called *Epigoni*, (Justin.)

EPIGRAM, in *Poetry*, a short poem in verse, treating only of one thing, and ending with some lively, ingenious, and natural thought or point. The word is formed of *επιγραμματα* inscription, of *επιγραψεν* to inscribe or write upon.

Epigrams then, originally signify inscriptions, and they derive their origin from those inscriptions placed by the ancients on their tombs, statues, temples, triumphal arches, &c. These, at first, were only simple monograms: afterwards, increasing their length, they made them in verse, to be the more easily retained: Herodotus and others have transmitted to us several of them. Such little poems retained the name of epigrams, even after the design of their first institution was varied, and people began to use them for the relation of little facts and accidents, the characterizing of persons, &c. The point or turn is a quality much insisted on by the critics, who require the epigram constantly to close with something poignant and unexpected, to which all the rest of the composition is only preparatory; while others, on the contrary, exclude the point, and require the thought to be equally diffused throughout the poem, without laying the whole stress on the close: the former is usually Martial's practice, and the latter that of Catullus.

The Greek epigrams have scarce any thing of the point or briskness of the Latin one: those collected in the Anthology have most of them a remarkable air

of ease and simplicity, attended with something just and witty; such as we find in a sensible peasant, or a child that has wit. They have nothing that bites, but something that tickles. Though they want the salt of Martial, yet to a good taste they are not insipid; except a few of them, which are quite flat and spiritless. However, the general faintness and delicacy of the pleasantry in them has given occasion for a Greek epigram, or *epigram à la Greque*, to denote, among the French, an epigram void of salt or sharpness.

The epigram admits of great variety of subjects: some are made to praise, and others to satirize; which last are much the easiest, ill-nature serving instead of point and wit. Boileau's epigrams are all satires on one or another; those of Des Reaux are all made in honour of his friends; and those of Mad. Scudery are so many eulogies. The epigram being only a single thought, it would be ridiculous to express it in a great number of verses.

EPIGRAPHE, among antiquarians, denotes the inscription of a building, pointing out the time when, the persons by whom, the uses, and the like, for which it was erected.

EPILEPSY, in *Medicine*, the same with what is otherwise called the *falling-sickness*, from the patient's falling suddenly to the ground. See MEDICINE *Index*.

EPILOBIUM, the WILLOW HERB. A genus of plants, belonging to the octandria class; and in the natural method ranking under the 17th order, *Calycanthemæ*. See BOTANY *Index*.

EPILOGUE, in *Oratory*, the end or conclusion of a discourse, ordinarily containing a recapitulation of the principal matters delivered.

EPILOGUE, in dramatic poetry, a speech addressed to the audience, after the play is over, by one of the principal actors therein; usually containing some reflections on certain incidents in the play, especially those in the part of the person that speaks it; and having somewhat of pleasantry, intended to compose the passions raised in the course of the representation: A practice which is ridiculed by the *Spectator*; and compared to a merry jig upon the organ after a good sermon, to wipe away any impressions that might have been made thereby, and send the people away just as they came.

EPIMEDIUM, BARREN-WORT. A genus of plants, belonging to the tetrandria class; and in the natural method ranking under the 24th order, *Corydalis*. See BOTANY *Index*.

EPIMENIDES, an ancient poet and philosopher, was born at Gnoſſus in Crete. Contrary to the custom of his country, he always wore his hair long; which, according to some, was because he was ashamed of being thought a Cretan: and indeed he does not seem to have had a high opinion of his countrymen, if that verse cited by St Paul be, as it is generally believed to be, his; "The Cretans are always liars, evil beasts, slow bellies." Many stories are related of him, too wonderful to merit attention; however, his reputation was so great over all Greece, that he was there esteemed a favourite of the gods. The Athenians being afflicted with the plague, and commanded by the oracle to make a solemn lustration of the city, sent Nicias, the son of Niceratus, with a ship to Crete, to desire Epimenides to come to them. He accepted their invitation,

Epime-
theus,
Epiphanius.

Epiphanius, accompanied the messengers to Athens, performed the lustration of the city, and the plague ceased. Here he contracted an acquaintance with Solon, whom he privately instructed in the proper methods for the regulation of the Athenian commonwealth. Having finished his business at Athens, the citizens offered him many valuable presents and high honours, and appointed a ship to carry him back to Crete; but he returned their presents, and would accept of nothing except a little branch of the sacred olive preserved in the citadel; and desired the Athenians to enter into an alliance with the Gnostians. Having obtained this, he returned to Crete; where he died soon after, aged 157 years; or as the Cretans, consistently with their character, pretended, 299. He was a great poet, and wrote 5000 verses on "the genealogy of the gods," 6500 "on the building of the ship Argos and Jason's expedition to Colchis," and 4000 "concerning Minos and Rhadamanthus." He wrote also in prose, "Concerning sacrifices and the commonwealth of Crete." St Jerome likewise mentions his "book of oracles and responses." The Lacedemonians procured his body, and preserved it among them by the advice of an oracle; and Plutarch tells us, that he was reckoned the seventh wise man by those who refused to admit Pericles into the number.

EPIMETHEUS, a son of Japetus and Clymene, one of the Oceanides, who inconsiderately married Pandora, by whom he had Pyrrha, the wife of Deucalion. He had the curiosity to open the box which Pandora had brought with her, and from thence issued a train of evils, which from that moment have never ceased to afflict the human race. Hope was the only one which remained at the bottom of the box, not having a sufficient time to escape, and it is she alone which comforts men under misfortunes. Epimetheus was changed into a monkey by the gods, and sent into the island Pitheculia.

EPIPHANIUS (St), an ancient father of the church, born at Besanducan, a village in Palestine, about the year 332. He founded a monastery near the place of his birth, and presided over it. He was afterwards elected bishop of Salamis; when he sided with Paulinus against Meletius, and ordained in Palestine Paulinian the brother of St Jerome; on which a contest arose between him and John bishop of Jerusalem. He afterwards called a council in the island of Cyprus, in which he procured a prohibition of the reading of Origen's writings; and made use of all his endeavours to prevail on Theophilus bishop of Alexandria to engage St Chrysostom to declare in favour of that decree: but not meeting with success, he went himself to Constantinople, where he would not have any conversation with St Chrysostom; and formed the design of entering the church of the apostles to publish his condemnation of Origen; but being informed of the danger to which he would be exposed, he resolved to return to Cyprus; but died at sea in the year 403. His works were printed in Greek, at Basil, 1544, in folio; and were afterwards translated into Latin, in which language they have been often reprinted. Petavius revised and corrected the Greek text by two manuscripts, and published it together with a new translation at Paris in 1622. This edition was reprinted at Cologne in 1682.

EPIPHANY, a Christian festival, otherwise called the *Manifestation of Christ to the Gentiles*, observed on the sixth of January, in honour of the appearance of our Saviour to the three magi or wise men, who came to adore him and bring him presents. The feast of epiphany was not originally a distinct festival; but made a part of that of the nativity of Christ, which being celebrated 12 days, the first and last of which were high or chief days of solemnity, either of these might properly be called *epiphany*, as that word signifies the appearance of Christ in the world.

The word in the original Greek, *επιφανια*, signifies *appearance* or *apparition*; and was applied, as some critics will have it, to this feast, on account of the star which appeared to the magi.—St Jerome and St Chrysostom take the epiphany for the day of our Saviour's baptism, when he was declared to men by the voice, *Hic est filius meus dilectus, in quo mihi complacui*: "This is my beloved Son, in whom I am well pleased." And accordingly it is still observed by the Coptæ and Ethiopians in that view. Others contend, that the feast of Christmas, or the nativity of our Saviour, was held in divers churches on this day; which had the denomination *epiphany*, or *appearance*, by reason of our Saviour's first appearance on earth at that time. And it must be allowed, that the word is used among the ancient Greek fathers, not for the appearance of the star to the magi, but for that of our Saviour to the world: In which sense St Paul uses the word *epiphania* in his second epistle to Timothy, i. 10.

EPIPHONEMA. See ORATORY, n^o 96.

EPIPHORA, in *Medicine*, a preternatural defluxion of the eyes, when they continually discharge a sharp serous humour, which excoriates the cheeks. See *MEDICINE Index*.

EPIPHYSIS, in *Anatomy*. See *ANATOMY Index*.

EPIPLOCELE, in *Medicine*, is a kind of hernia or rupture, in which the omentum subsides into the scrotum.

EPIPLOMPHALON, in *Medicine*, an hernia umbilicalis, proceeding from the omentum falling into the region of the umbilicus or navel.

EPIPLOON. See *OMENTUM, ANATOMY Index*.

EPIRUS, a district of ancient Greece, bounded on the east by Etolia, on the west by the Adriatic, on the north by Thessaly and Macedon, and on the south by the Ionian sea. This country was anciently governed by its own princes, in which state it made a very considerable figure. The country, according to Josephus, was first peopled by Dodanim the son of Javan and grandson of Japhet. The people were very warlike; but they continued in their savage state long after their neighbours were civilized; whence the islanders used to threaten their offenders with transportation to Epirus. Their horses were in great request among the ancients, as well as the dogs produced in one of the divisions called *Molossus*; and hence these dogs were called by the Romans *Molossi*.

The history of Epirus commences with the reign of Pyrrhus the son of Achilles by Deidamia the daughter of Lycomedes king of Scyros. He is said to have behaved with great bravery at the siege of Troy; but it would appear that he behaved with no less barbarity. After the city was taken, he is said to have killed old king Priam with his own hand; to have thrown Astyanax the son

Epiphany
||
Epirus.

Epirus. of Hector and Andromache headlong from a high tower; and sacrificed Polyxena the daughter of Priam on the tomb of his father. He carried Andromache with him into Epirus, where he settled by the advice of the famous soothsayer Helenus, one of Priam's sons, who had served during the Trojan war both under his father and himself. The only remarkable period of the history of Epirus is the reign of Pyrrhus II. who made war upon the Romans. He was invited into Italy by the Tarentines; and embarked about 280 B. C. After having escaped many dangers by sea, he landed in that country, and with great difficulty gained a victory over the Romans; but he was afterwards utterly defeated by them †, and obliged to return into his own country. To retrieve his honour, he then undertook an expedition against Macedon; where he overthrew Antigonus, and at last made himself master of the whole kingdom. He then formed a design of subduing all the other Grecian states; but met with such an obstinate resistance at Lacedæmon, that he was obliged to drop the enterprise; and was soon after killed at the siege of Argos by a woman, who from the wall threw a tile upon his head. Deidamia, the grand-daughter of Pyrrhus, was the last that sat on the throne of Epirus. She is said to have been murdered after a short reign; upon which the Epirots formed themselves into a republic.

† See Rome.

Under the new form of government Epirus never made any considerable figure, but seems rather to have been dependent on the kingdom of Macedon. The Romans having conquered Philip king of that country, restored the Epirots to their ancient liberty; but they, forgetful of this favour, soon after took up arms in favour of Perseus. As a punishment for this ingratitude, the Romans gave orders to Paulus Emilius, after the reduction of Macedon, to plunder the cities of Epirus, and level them with the ground. This was punctually executed throughout the whole country on the same day and at the same hour. The booty was sold, and each foot-soldier had 200 denarii, that is, six pounds nine shillings and two pence, and each of the horse the double of this sum. An hundred and fifty thousand men were made slaves, and sold to the best bidder for the benefit of the republic. Nor did the vengeance of Rome stop here; all the cities of Epirus, to the number of 70, were dismantled, and the chief men of the country carried to Rome, where they were tried, and most of them condemned to perpetual imprisonment. After this terrible blow, Epirus never recovered its ancient splendor. Upon the dissolution of the Achæan league, it was made part of the province of Macedon; but when Macedon became a diocese, Epirus was made a province of itself, called the province of *Old Epirus*, to distinguish it from *New Epirus*, another province lying to the east of it. On the division of the empire, it fell to the emperors of the east, and continued under them till the taking of Constantinople by the Latins, when Michael Angelus, a prince nearly related to the Greek emperor, seized on Etolia and Epirus, of which he declared himself despot or prince; and was succeeded by his brother Theodorus, who took several towns from the Latins, and so far enlarged his dominions, that, disdaining the title of *despot*, he assumed that of *emperor*, and was crowned by Demetrius archbishop of Bulgaria. Charles, the last prince

of this family, dying without lawful issue, bequeathed Epirus and Acarnania to his natural sons, who were driven out by Amurath the second. Great part of Epirus was afterwards held by the noble family of the Castriots; who, though they were masters of all Albania, yet styled themselves princes of Epirus. Upon the death of the famous George Castriot, surnamed *Scanderbeg*, Epirus fell to the Venetians, who were soon dispossessed of it by the Turks; in whose hands it still continues, being now known by the name of *Albania*, which comprehends the Albania of the ancients, all Epirus, and that part of Dalmatia which is subject to the Turks.

EPISCOPACY, that form of church-government, in which diocesan bishops are established as distinct from and superior to priests or presbyters. We have already observed, that it is a long time since the ministers of religion have been distinguished into different orders, and that it has been much controverted whether the distinction be of divine or human right; whether it was settled in the apostolic age or afterwards. (See BISHOP.) This controversy commenced soon after the Reformation; and has been agitated with great warmth between the *Episcopalians* on the one side, and the *Presbyterians* and *Independents* on the other. Among the Protestant churches *abroad*, those which were reformed by *Luther* and his associates are in general *episcopal*; whilst such as follow the doctrines of *Calvin* have for the most part thrown off the order of bishops as one of the corruptions of popery. In *England*, however, the controversy has been considered as of greater importance than on the *Continent*; for it has there been strenuously maintained by one party, that the *episcopal order* is essential to the constitution of the church; and by others, that it is a pernicious encroachment on the rights of men, for which there is no authority in scripture. Though the question has for some time lain almost dormant, and though we have no desire to revive it; yet as a work of this kind might perhaps be deemed defective, did it contain no account whatever of a controversy which has employed some of the ablest writers of the past and present centuries, we shall give a fair though short view of the chief arguments by which the advocates of each contending party have endeavoured to support their own cause, leaving our readers to judge for themselves where the truth lies. See INDEPENDENTS and PRESBYTERIANS.

The *Independent* maintains, that under the gospel dispensation there is nothing which bears the smallest resemblance to an exclusive priesthood; that Christ and his apostles constituted no permanent order of ministers in the church; but that any man who has a firm belief in revelation, a principle of sincere and unaffected piety, a capacity for leading devotion and communicating instruction, and a serious inclination to engage in the important employment of promoting the everlasting salvation of mankind; is to all intents and purposes a regular minister of the New Testament, especially if he have an invitation to the pastoral office from some particular society of Christians.

Against this scheme, which supposes the rights of Christians all equal and common, and acknowledges no authority in the church except what may be derived from the election of her members, the Protestant *Episcopalians* reason in the following manner. He admits, as an undoubted truth, that our blessed Lord gave to

3
Episcopal arguments against it.
none.

¹Episcopacy. none of his immediate followers authority or jurisdiction of such a nature as could interfere with the rights of the civil magistrate, for all such authority was disclaimed by himself: "My kingdom (said he to Pilate) is not of this world:" and to a certain person who asked him to decide a question of property between him and his brother, he replied, "Man, who made me a judge or a divider over you." But when it is considered, that Christ came into this world to "turn men from darkness to light, and from the power of Satan to the living God; that he gave himself for us, that he might redeem us from all iniquity, and purify to himself a peculiar people zealous of *good works*; that of these works many are such as unregenerate humanity has no inclination to perform, and that the doctrines which he revealed are such as human reason could never have discovered; the advocate for episcopacy thinks it was extremely expedient, if not absolutely necessary; that, when he ascended into heaven, he should establish upon earth some authority to illustrate the revelation which he had given, and to enforce obedience to the laws which he had enacted. There is nothing, continues he, more strictly required of Christians, than that they live together in unity, professing the same faith, joining in the same worship, and practising the same virtues. But as men have very different passions, prejudices, and pursuits, such unity would be impossible, were they not linked together in *one society* under the government of persons authorized to watch over the purity of the faith, to prescribe the forms of public worship, and to explain the nature, and inculcate the necessity of the several virtues. The society of Christians, in respect of its unity and organization, is compared to the human body: for "as we have many members in one body, and all members have not the same office; so we being many are one body in Christ, and every one members one of another," (Rom. xii. 4, 5.) It is called the *church*, the *kingdom of heaven*, and the *kingdom of God*; and its affairs, like those of every other kingdom, are administered by proper officers in subordination to the ONE LORD, who, "when he ascended up on high, and led captivity captive, gave some apostles, and some prophets, and some pastors and teachers, for the perfecting of the saints, for the work of the ministry, for the edifying of the body of Christ:" (Ephes. iv. 8—13.) That those various orders of ministers were vested with real authority in the church might be inferred from principles of reason as well as from the dictates of revelation. A society without some sort of government, government without laws, or laws without an executive power, is a direct absurdity. Where there are laws, some must govern, and others be governed; some must command, and others obey; some must direct, and others submit to direction. This is the voice of *nature*; it is likewise the language of *scripture*. "Obey them (says the inspired author of the epistle to the Hebrews) who have the rule over you, and submit yourselves; for they watch for your souls as they that must give account." A text which shows that the authority of the ministers of religion was distinct from that of the civil magistrate, whose duty is to watch, *not for the souls*, but for the *lives and properties*, of his subjects.

Of the society thus constituted, it was not, as of a philosophical sect, left to every man's *choice* whether or

not he would become a member. All who embrace the faith of the Redeemer of the world are required to be *baptized*, under the pain of forfeiting the benefits of redemption: but one great purpose for which baptism was instituted, is to be the rite of initiation into the church of Christ; "for by one spirit are we all baptized into one body, whether we be Jews or Gentiles, whether we be bond or free," (1 Cor. xii. 13.). Of baptism, whatever be the importance, it is evident, that to receive it, is not, like the practice of justice, or the veneration of the Supreme Being, a duty resulting from the relations of man to his Creator and fellow-creatures; that its whole efficacy, which in scripture is said to be nothing less than the remission of sins, is derived from *positive institution*; and therefore, that the *external rite* can be of no avail, but when it is administered in the *manner prescribed*, and by a person *authorized* to administer it. That *all* Christians are not vested with this authority, as one of the common privileges of the faith, appears from the commission which our Saviour after his resurrection gave to his apostles. At that period, we are assured that the number of his followers was not less than *five hundred*; yet we find, that to the *eleven disciples* only did "he come and speak, saying, All power is given unto me in heaven and in earth; go ye, therefore, and teach all nations, baptizing them in the name of the Father, and of the Son, and of the Holy Ghost."

Of the 500 disciples there is surely no reason to believe that there were not *many* well qualified to instruct either a Jew or a Gentile in the doctrines of the gospel; and it is certain, that *any one* of them could have washed his convert with water in the name of the Holy Trinity as well as St Peter or St John: but such an unauthorized washing would not have been Christian baptism, nor of equal validity with it, any more than the opinion of a lawyer at the bar is the judgment of a court of justice, or of equal obligation. It is the commission of the sovereign which gives force to the judgment of the court; it is the commission of Christ which gives validity to baptism. The same reasoning is applicable to the Lord's supper, which, if it be not administered by those who have authority for such administration, cannot be deemed a sacrament of Christ's institution.

These two rites are the external badges of our profession. By the *one*, we are incorporated into that society of which our Redeemer is the head and sovereign: in the celebration of the *other*, we have a right to join, whilst of that society we continue members. But if by an open and scandalous disregard of the precepts of the gospel, we should prove ourselves unworthy of its privileges, the same persons who are authorized to admit us into the church, are likewise vested with authority to cast us out of it: for to them were given "the keys of the kingdom of heaven (or the church), with assurance, that whatsoever they should bind on earth, should be bound in heaven; and whatsoever they should loose on earth, should be loosed in heaven," (Mat. xviii. 18.) As baptism is to be administered so long as there shall be persons to be enlisted under the banners of Christ, and the Lord's Supper to be celebrated so long as it shall be the duty of soldiers to adhere to the standard of their leader and their head; and as it is likewise to be feared that there will never come a time when

⁴Christians linked together in one society called the church, the kingdom of heaven, and the kingdom of God.

⁵The church governed by proper officers.

⁶Episcopacy. All Christians required to be members of the church.

⁷All Christians not authorized to administer the sacraments.

⁸ **Episcopacy.** when all Christians shall "walk worthy of the vocation wherewith they are called;" it follows, that this power of keys, which was originally given to the apostles, must continue in the church through all ages, even unto the end of the world. But as we have seen, that it was not at first intrusted to all the disciples in common, as one of the privileges inseparable from their profession, and as no body of men can possibly transfer an authority of which they themselves were never possessed; it is certain, that even now it cannot, by the election of one class of Christians, be delegated to another, but must, by some mode of succession, be derived from the apostles, who were sent by Christ as he was sent by his Father. To argue from the origin of civil to that of ecclesiastical government, although not very uncommon, the Episcopalian deems extremely fallacious. Of the various nations of the world, many of the sovereigns may indeed derive their authority from the suffrages of their subjects; because in a state of nature every man has an inherent right to defend his life, liberty and property; and what he possesses in his own person, he may for the good of society transfer to another: but no man is by nature, or can make himself, a member of the Christian church; and therefore authority to govern that society can be derived only from him by whom it was founded, and who died that he might "gather together in one all the children of God."

⁹ Authority to govern the church can be derived only from Christ.

Against such reasoning as this it hath been urged, that to make institutions, which like baptism and the Lord's supper are generally necessary to the salvation of all Christians, depend for their efficacy upon the authority or commission of a particular order, appears inconsistent with the wisdom and goodness of God; as by such an economy an intolerable domination would be established over the souls of men, and the purpose for which the Saviour of the world died might be in some degree defeated by the caprice of an ignorant and arbitrary priesthood. The objection is certainly plausible; but the Episcopalian affirms, that either it has no weight, or militates with equal force against the wisdom of Providence in the government of this world.—In every thing, he observes, relating to their temporal and to their spiritual interests, mankind are all subjected to mutual dependence. The rich depend upon the poor, and the poor upon the rich. An infant neglected from the birth would barely cry and cease to live; nor is it easily to be conceived, that in the more rigid climates of the earth a full grown man could provide even the necessaries of mere animal life. Of religion, it is certain that in such a state nothing could be known; for there is not the smallest reason to imagine that any individual of the human race—an Aristotle, a Bacon, or a Newton, had he been left alone from his infancy, without culture and without education,—could ever, by the native vigour of his own mind, have discovered the existence of a God, or that such speculations as lead to that discovery would have employed any portion of his time or his thoughts. Even in civilized society it would be impossible, in the present age, for any man, without the assistance of others, to understand the very first principles of our common Christianity; for the scriptures, which alone contain those principles, are written in languages which are now nowhere vernacular. In the fidelity of translators, therefore, every il-

literate disciple of Jesus must confide, for the truth of those doctrines which constitute the foundation of all his hopes; and as no man ever pretended that the Christian sacraments are more necessary to salvation than the Christian faith, the Episcopalian sees no impropriety or inconsistency in making those persons receive baptism and the Lord's supper by the ministrations of others, who by such ministrations must of necessity receive the truths of the gospel.

By such arguments as these does the Episcopalian endeavour to prove that Christ constituted some permanent order of ministers in the church, to whom in the externals of religion the great body of Christians are commanded to pay obedience; and thus far the Presbyterian agrees with him; but here their agreement ends. They hand in hand attack the Independent with the same weapons, and then proceed to attack each other. The one maintains, that originally the officers of the Christian church were all presbyters or elders of one order, and vested with equal powers; whilst the other holds, that Christ and his apostles appointed divers orders of ministers in the church; that of these orders the highest alone was empowered to ordain others; and that therefore obedience, as to those who watch for our souls, can be due only to such as are episcopally ordained.

In behalf of the Presbyterian plea it is urged, that the titles of bishop and presbyter, being in the New Testament indifferently given to the same persons, cannot be the titles of distinct ecclesiastical officers; which appears still more evident from the ordination of Timothy, who, although he was the first bishop of Ephesus, received his episcopal character by the imposition of the hands of the presbytery.—That one and the same man is, in the New Testament, styled sometimes a bishop and sometimes a presbyter, cannot be denied; but although every apostolic bishop was therefore undoubtedly a presbyter, it does not of course follow, says the Episcopalian, that every presbyter was likewise a bishop. In the Old Testament, Aaron and his sons are without any discrimination of order frequently styled priests; and in the New, both St Peter and St John call themselves presbyters, as St Paul, upon one occasion, styles himself a deacon—*δυνακος* (Eph. iii. 7.): yet no man ever supposed those apostles to have been such ecclesiastical officers as modern presbyters and deacons; and it is universally known, that in the Jewish priesthood there were different orders, and that Aaron was of an order superior to his sons. This being the case, the presbyters, by the laying on of whose hands Timothy was made a bishop, may have been of the same order with St Peter and St John; and if so, it follows that his ordination was Episcopal. At all events, we are certain, continues the advocate for Episcopacy, that it was not, in the modern sense of the word, Presbyterian; for the gift, which in the first epistle is said to have been "given by prophecy with the laying on of the hands of the presbytery," is in the second said to have been "in him by the putting on of the hands of St Paul." And here it is worthy of observation, that the preposition used in the former case is *μετα*, which signifies concurrence rather than instrumentality; but that in the latter is *δια*, which, as every Greek scholar knows, is prefixed to the instrumental cause by which any thing is effected: so that whatever may have been the order of the presbyters

¹⁰ An objection answered.

¹¹ Episcopacy.

¹¹ A permanent order of ministers constituted by Christ.

¹² The Presbyterian plea.

¹³ Episcopal arguments against it.

Episcopacy. byters who concurred, St Paul appears to have been the sole ordainer. But by the confession of all parties, St Paul was a bishop in the highest sense in which that word is ever used; and the powers of the episcopate not being parcelled out among various partners, of whom each possesses only a share, the imposition of his hands was sufficient for every purpose which could have been effected by the hands of the whole college of apostles.

It appears, therefore, that from the promiscuous use of the titles *bishop* and *presbyter*, and from the *ordination of Timothy*, nothing can with certainty be concluded on either side of this celebrated question. But if, instead of resting on mere words, which when taken alone and without regard to the context, are almost all of ambiguous signification, we attend to some important facts recorded in the New Testament, the Episcopalian thinks we shall in them discover sufficient evidence that the government of the primitive church was prelatical.

During our Saviour's stay upon earth, it is undeniable that he had under him two distinct orders of ministers—the twelve, and the seventy; and after his ascension, immediately before which he had enlarged the powers of the *eleven*, we read of *apostles, presbyters, and deacons*, in the church. That the presbyters were superior to the deacons, and the apostles superior to both, is universally acknowledged; but it has been said, that in Scripture we find no intimation that the apostolic order was designed for continuance. A Quaker says the same thing of water-baptism; and the Episcopalian observes, that it would be difficult to point out by what passage of Scripture, or what mode of reasoning, those who upon this plea reject the apostolic order of Christian ministers, could overthrow the principles upon which the disciples of *George Fox* reject the use of that rite which our Saviour instituted for the initiation of mankind into his church. They were the *eleven* alone to whom Christ said, "Go ye therefore and teach all nations, baptising them in the name of the Father, and of the Son, and of the Holy Ghost:" and therefore, although we frequently find presbyters and deacons administering the sacrament of baptism, we must conclude, that as a *judge* administers justice by authority derived from his *sovereign*, so those *inferior officers* of the church administered baptism by authority derived from the *apostles*. Indeed, had they pretended to act by any other authority, it is not easily to be conceived how *their* baptism could have been the baptism instituted by Christ; for it was not with the *external washing* by whomsoever performed, but with the *eleven* and their successors, that he promised to be "always, even unto the end of the world."

That the *eleven* did not consider this promise, or the commission with which it was given, as terminating with their lives, is evident from their admitting others into their own order; for which they had competent authority, as having been sent by Christ as he was sent by his Father. When St Paul, to magnify his office and procure to it from the Galatians due reverence, styles himself, "an apostle not of men, neither by man, but by Jesus Christ and God the Father," he must have known some who derived their apostolic mission by man; otherwise he could with no propriety have

claimed particular respect, as he evidently does, from what was in his own apostleship no particular distinction. At that very early period, therefore, there must have been in the church *secondary* apostles, if they may be so called, upon whom, by imposition of hands, or by some other significant ceremony, the eleven had conferred that authority which was given to them by their Divine Master. Such were *Matthias* and *Barnabas*; such likewise were *Timothy*, *Titus*, and the *angels* of the seven churches in Asia, with many others whose names and offices are mentioned in the New Testament.

That *Matthias* and *Barnabas* were of the apostolic order, has never been controverted; and that *Timothy* and *Titus* were superior to modern presbyters, is evident from the offices assigned them. Timothy was, by St Paul, empowered to *preside* over the presbyters of Ephesus, to receive accusations against them, to *exhort*, to *charge*, and even to *rebuke* them; and *Titus* was, by the same apostle, left in Crete for the express purpose of setting things in order, and ordaining *presbyters* in every city. To *exhort*, to *charge*, and with authority to *rebuke* one's equal, is certainly incongruous; and therefore the Episcopalian thinks the powers conferred on Timothy altogether inconsistent with that parity of order and of office for which his antagonists so strenuously plead. Even the commission given to *Titus* appears in his eyes by much too extensive for a Presbyterian minister, who, after having ordained in one city, could not have proceeded to ordain in another without the consent and assistance of his brother and fellow-labourer. With respect to the *angels* of the Asiatic churches, he observes, that in the Old Testament the title of *angel* is sometimes given to the *Jewish high-priest*, and particularly by the prophet Malachi, who calls him "the messenger (*αγγελος*) of the Lord of Hosts;" and that the *angels* of the churches mentioned by St John, were *Christian high-priests*, or *bishops* presiding over more than one congregation, as it is affirmed by all the ancient writers, cannot, he thinks, be denied by any man who will take the trouble to compare Scripture with Scripture. We read (Acts xix. 10. and 20.), that "in the space of two years all they who dwelt in Asia heard from St Paul the word of the Lord Jesus, both Jews and Greeks; and that there the word of God grew mightily and prevailed:" but with what truth or propriety could this have been said, if at the time of St John's writing the Apocalypse, which was 30 years after St Paul's death, all the Christians of Proconsular Asia were comprised in seven congregations, which assembled, each with its proper pastor, to perform, in one place, the duties of public worship? In a word, the advocate for Episcopacy insists, that no man, who reads without prejudice the acts of the apostles, the epistles of St Paul, and the Apocalypse of St John, can seriously believe that *Timothy*, *Titus*, *Ephraoditus*, *Softenes*, and *Silvanus*, with the *angels* of the seven churches in Asia, were mere presbyters, or that the government of the church was, in those days, by a college of elders.

When from the inspired penmen of the New Testament he proceeds to examine the succeeding writers of the Christian church, the Episcopalian finds such multiplied and concurring evidence of the apostolic institution of episcopacy, as he thinks it impossible to resist without

14
Three orders of Christian ministers during our Saviour's stay upon earth; and likewise after his ascension into heaven.

15
The apostolic or highest order designed to be permanent.

16
Matthias, Barnabas, Timothy, Titus, and the angels of the seven churches in Asia, bishops.

Episcopacy. without denying the truth of all ancient history, and even shaking the pillars of revelation itself; for "in the noble army of martyrs," the witnesses of the episcopal government of the church are earlier, and by far more numerous, than those who testify that the *gospel* of *St Matthew* was written by that apostle, or that the book of the *Apocalypse* is canonical Scripture. The authority of the *fathers* indeed is at present very low; but should they be allowed to be as fanciful divines and as bad critics as their worst enemies are pleased to represent them, this would detract nothing from their evidence when they bear witness to the constitution of the church in their own times; for of their *integrity* there can be no doubt: and what the Episcopalian wants of them is only their testimony to matters of fact which fell under the cognizance of their own senses, and about which therefore they could not be deceived. It is here indeed chiefly that he triumphs over his antagonists. In the second and third centuries there was no general council, nor any Christian sovereign. A prelacy therefore, he urges, could not have been *universally* introduced, during that period, either by a concert among the clergy, or by the authority of the civil magistrate. Yet that even *then* there was no church under heaven, of which the government was not episcopal, has been confessed by some of the most learned writers among the Presbyterians themselves; whence he concludes that episcopacy is of divine institution.

17
The divine
right of E-
piscopacy.

The candid Episcopalian, however, allows, that in the apostolic age there may have been some churches which at first had only bishops and deacons to perform the offices of religion; for when the number of disciples in any place was so small that they could all meet in one assembly, there was no necessity for any other order of ministers: but it appears that, from the very *beginning*, *bishops*, *presbyters*, and *deacons*, were settled in all the *larger* cities of the Roman empire; and it was in those days an allowed maxim, that without a *bishop* there could be *no church*. The better to understand the original state and institution of episcopacy, it is necessary to observe, that the empire, which contained almost all the known part of the Christian world, was by Augustus Cæsar divided into provinces, subjected each to the authority of one chief magistrate, who was commonly a *prætor* or *proconsul*, and who resided in the metropolis or chief city of the province. A province comprehended the cities of a whole region; and in the age of the apostles, each city was under the immediate government of certain magistrates within its own body, known by the name of *βουλη*, or *senatus*, *ordo* and *curia*, "the states and court of the city." Those magistrates were subordinate to the *prætor* or *proconsul*: but among them there was *one* superior to the rest, called sometimes *dictator* and sometimes *defensor civitatis*, whose jurisdiction extended not only over the city itself, but likewise over all the adjacent territory. That territory was denominated *περασησια*, or the suburbs, and often reached to the distance of 10 or 12 miles round the city, and sometimes much farther, containing within it many villages and small towns under the government of the city magistrates. From some passages in the New Testament, and from the concurring evidence of the earliest writers of the church, it appears to have been the purpose of the apostles to settle a bi-

18
The origin
of dioceses.

Vol. VIII. Part I.

shop in *every* city where there was a civil magistracy: Episcopacy. but as they could not be personally present in all places at once, it was natural for them to *enter* upon the great work of converting the nations by *first* preaching the gospel in that city of each province which was the ordinary residence of the governor; because to it there must have been the greatest resort of people, who would carry the glad tidings with them into the country when they returned. Accordingly, having dispersed themselves over the empire, and made numbers of proselytes in the principal cities, they fixed in each, where they saw it necessary, a *bishop*, with a college of *presbyters* and *deacons*; and gave to those bishops, who were at first called *apostles*, a commission, as the *other* cities of the province should be converted, to fix in them bishops also.

In some of the smaller cities, it is extremely probable that a bishop and a deacon were for a short time the only ecclesiastical officers, till the number of Christians increased so much as to make it impossible for them all to assemble in one house for the purposes of public worship. The bishop then ordained *presbyters* to officiate in those congregations where he himself could not be present, and to assist him in other parts of his pastoral office; but in all their ministrations the *presbyters* were subordinate to him, who was the chief pastor within the city, who composed the prayers which were offered up in public, and to whom all the other ministers of religion were accountable for their conduct. So long as the number of the faithful was confined within the *walls* of the city, it appears that the bishop with his *presbyters* and *deacons* lived together as in a college; that divine service was every Lord's day, or oftener, performed in what was afterwards called the cathedral or mother-church, by the bishop himself, assisted by some of his clergy; and that the congregations which met in other churches, having no *fixed* pastors, were supplied by such *presbyters* as the bishop chose to send to them from his own church. Whilst matters continued in this state, the clergy had no other revenues than what arose from the voluntary oblations of the people; which were indeed so large as not only to support them with decency, but likewise to answer other ends of charity and munificence. They were commonly divided into four equal parts; of which one was allotted to the bishop, a second to the inferior clergy, a third to the poor, and a fourth to keep the churches in repair; and it was considered as a part of the bishop's duty to take care that the offerings should be faithfully applied to these purposes.

When converts increased in number, and churches were built in the suburbs, each of those churches had a fixed pastor similar to a parish-priest among us; but still those pastors, as well as the city-clergy, ministered in subordination to the bishop, whose authority extended as far as the civil authority of the Roman magistrate, within which district or diocese it was supreme over all orders of Christians. This every man knows who is acquainted with ecclesiastical history; for the bishop alone could ordain *priests* and *deacons*, administer the rite of *confirmation*, *absolve penitents* who were under church-censure, and *exclude from communion* heretics and notorious offenders; and from his sentence there lay no appeal but to a synod of comprovincial bishops.

19
The origin
of parishes.

Such synods were in each province convened by the

Episcopacy bishop of the chief city; for the apostles having been careful to place in those cities men of the most eminent gifts and abilities, the other bishops of the provinces applied to them for advice upon every emergency, and paid a particular deference to them upon every occasion. So that though all bishops were of equal authority as *bishops*, yet when they met to consecrate a new bishop, or to deliberate upon the affairs of the church, they yielded a precedency to the bishop of the metropolis, who called them together, and who sat as *president* or *moderator* of the synod. Hence the origin of metropolitans or *archbishops*; whose authority was so considerable, that though there is not a doubt but the *election* of bishops was anciently placed in the clergy and people of the vacant diocese, yet the bishop *elect* could not be *consecrated* without the consent of the archbishop of the province.

²⁰
The origin
of metropo-
litans.

In consequence of the extensive powers with which the primitive bishops were vested, they are commonly styled in the writings of those times *presidents*, *provosts*, or *inspectors* of the church, *chief priests*, *princes of the clergy*, and even *princes of the people*; but their authority was wholly spiritual. Those prelates, imitating the example of their Divine Master when on earth, neither possessed nor assumed to themselves any jurisdiction over the *properties* or *civil rights* of men. In consequence of St Paul's having reprimanded the Corinthians for going to law before the *unbelievers*, they were indeed often chosen as *arbiters* of such civil disputes as arose between individuals under their episcopal government; but on these occasions they could not act unless the submission was *voluntarily* made by both the contending parties, and *then* their decision was final. When the empire became Christian, this privilege was confirmed to them by law; for any *civil* cause depending before a court of justice could be withdrawn, and by the mutual consent of parties be submitted to the arbitration of the bishop, whose award, which in former times could be enforced only by the terror of church-censures, was then enforced by the secular magistrate. In *criminal* causes, where the trial might be for life or death, they were prohibited both by the canons of the church and by the laws of the state from acting as judges; and therefore they never suffered such causes to come before them, except when it was necessary that the person accused, if found guilty, should be excluded from the communion of the faithful. But they had so many civil causes flowing in upon them, that they were soon obliged to devolve

²¹
The probable
origin
of spiritual
courts.

part of that care upon other persons, in whose knowledge, prudence, and integrity, they could fully confide: and as the persons employed to act in the bishop's stead were often *laymen*, it has been conjectured that they gave rise to the office of *lay-chancellor* in the church, and to all that train of spiritual judges and spiritual courts against which such numbers are disposed to clamour.

chief priests at the religious rites which were usually celebrated at the opening of their public assemblies, the bishops came naturally to discharge that duty on such occasions, when they must have shared in the rank by sharing in the functions of the chief. The situation in which they thus appeared at the opening of all political conventions, would enable them to join with much effect in the deliberations which ensued; and their superior knowledge, their sacred character, and their influence with the people, would soon acquire them power equal to their rank. They must therefore have been well entitled to demand admission into that council which was formed by the king and the lay-chiefs at the national assemblies: and as they balanced the authority of those chiefs, we cannot doubt that the king would be disposed to give the utmost effect to their claim. Accordingly, we find the dignified clergy, who received large grants of land to be held on the same tenures with the lands of the lay-magistrates, presiding along with those magistrates in the provincial assemblies of every degree in all the Gothic nations, and enjoying every advantage in point of rank and authority in their national diets. Hence the bishop of Rome, and several bishops in Germany, have, like the dukes and marquises of that empire, been for a long time sovereign princes; and hence too the bishops of England and Ireland have always sat, and have an equal right with the lay-peers to sit, in the upper house of parliament. It is however obvious, that, so far as episcopacy is of *apostolical* institution, those peers and princes possess not the *original* character in any higher degree than the bishops in America, who are barely tolerated, or than those in Scotland who do not enjoy that privilege; and that confirmation administered, or holy orders conferred, by a persecuted prelate, must be as effectual to the purposes of religion, as if given by a German prince or an English peer.

In this short view of episcopacy, it has been our endeavour to do justice to the subject, without suffering ourselves to be influenced by partiality or prejudice. As we are not ourselves episcopalians, we have advanced nothing of our own; but have selected from English writers, who have at different times undertaken to defend the *divine right* of episcopacy, such facts and arguments as to us appear to be of the most importance, or to have the greatest weight, without remarking upon them, or offering any answer. The reasoning employed to prove that the order of bishops was instituted by the apostles, is taken from a work prepared for the press by Dr Berkeley prebendary of Canterbury, and son of the celebrated bishop of Cloyne. For the rest of the detail we are indebted chiefly to Bingham's *Origines Ecclesiasticæ*; a performance in great estimation with those English divines who are commonly known by the appellation of *high churchmen*. As editors of a work of this kind, it is not our business to be of *any party*, or to support, in opposition to all others, a *particular church*, though that church should be our own: We shall therefore treat *independency* and *presbytery* as we have treated *episcopacy*, by employing some able writer of each society to plead his own cause. Meanwhile, we shall conclude this article with a few reflections, which, though they come from the pen of an obscure author, deserve to be engraved deep in the memory of every controvertist of every communion.

“ On

Episcopacy.
²²
Bishops had
no civil
rank till af-
ter the sub-
version of
the Roman
empire and
the conver-
sion of the
Gothic na-
tions.

Episcopacy. "On complicated questions (says a late apologist for the episcopal church in Scotland), men will always differ in opinion; but conscious each of the weakness of his own understanding, and sensible of the bias which the strongest minds are apt to receive from thinking long in the same track, they ought to differ with charity and meekness. Since unhappily there are still so many subjects of debate among those who name the name of Christ; it is doubtless every man's duty, after divesting himself as much as possible of prejudice, to investigate those subjects with accuracy, and to adhere to that side of each disputed question which, after such investigation, appears to him to be the truth: but he transgresses the favourite precept of his divine Master, when he casts injurious reflections, or denounces anathemas, upon those who, with equal sincerity, may view the matter in a different light; and by his want of charity does more harm to the religion of the *Prince of Peace*, than he possibly could do good, were he able to convert all mankind to his own orthodox opinions."

²³
Moderation
in contro-
versy re-
commend-
ed.

²⁴
Episcopal
church of
Scotland.

The following is a short history of the episcopal church of Scotland, extracted from a more detailed account by a member of that church.

The real tenets of the Scotch episcopalians, or members of what was at one period the established church of Scotland, he observes, appear to be very imperfectly understood. About the time of the reformation from popery, the want of order and decency in the worship of the reformed church was abolished in the reign of James VI. by the establishment of episcopacy on very liberal principles. This mode of worship obtained the sanction of the most respectable part of the nation, and continued to flourish under the auspices of government, till it was overthrown by the sticklers for the *national covenant*. Its restoration was effected in the year 1662, and twenty-seven years afterwards it was again abolished by the advocates of the prince of Orange.

It may be proper to observe, that the Scotch episcopal church had no public liturgy during her legal establishment. It is indeed true, that the English book of common prayer was used by the first reformers, and there is reason to believe that John Knox himself was by no means inimical to set forms of prayer, nor to clerical subordination; but his successor, Andrew Melvil, a man much inferior to him in point of erudition, introduced an equality among the clergy, and excited the odium of the people against the liturgy to such a degree, that an attempt to modify the prayer book for the use of the church of Scotland, was productive of the solemn league and covenant, and the subsequent ruin of the unfortunate Charles.

During the reign of William III. the episcopalians were treated with some degree of severity, because they could not transfer that allegiance to him which they had sworn to King James. It is said that they were prohibited from officiating on the sabbath day, except "in their own hired houses, where they received such friends as chose to come in unto them." In this manner was their worship conducted, praying either extempore, or from premeditation, till the accession of Queen Anne, when the English liturgy was introduced by degrees into Scotland, under the sanction of an act of parliament, passed on the 3d of March 1712, "to prevent the disturbing of those of the episcopal communion

in that part of Great Britain called Scotland, in the exercise of their religious worship, and in the use of the liturgy of the church of England." But as their attachment to the house of Stuart was well known, they were, at the rebellion of 1715, laid under some restraints, yet neither severe in their nature, nor of any long continuance, since in 1720 their places of worship were as numerous as before, and frequented by numbers both of rank and respectability, many of whom held places under government.

In England, Dr Sancroft, archbishop of Canterbury, with five other bishops, were deprived of their sees for refusing their allegiance to King William, which occasioned a schism in the church, as they were extremely popular. Different opinions were entertained respecting the nature and design of the Lord's supper, and the controvertedly infected the episcopalians of Scotland. The introduction of prayers into public worship in behalf of departed friends, was at least a very impolitic step at such a critical period, when every thing favouring of popery was held in the utmost abhorrence. On the death of Dr Rose, the proscribed bishop of Edinburgh, the diocesan form of church government was opposed by such of the presbyters as had been raised to the episcopal dignity, and it was proposed to govern the whole church by a college of bishops. This plan, for the adoption of which no precedent could be found in the annals of history, was successfully opposed by many of the most enlightened bishops, and it was of consequence abandoned.

The Scotch episcopalians, it is well known, were always charged with an undue attachment to the Stuart family, which was even considered as their most distinguishing tenet; yet there is some reason to believe that the public opinion of this matter was rather exaggerated. They have invariably maintained that the Almighty, and not the people, is the ruler of princes, which fairly places them beyond the imputation of a republican or levelling spirit. The several restraints laid on Scotch episcopalians from time to time, with a view to eradicate their attachment to the Stuart family, were happily removed in the year 1792, and they enjoyed a free toleration like the rest of dissenters. It was about this time that the clergy of this church, with a very few exceptions, took the oaths of abjuration and allegiance.

It is well known, it is added by the same writer, from whose account the above is taken, that in Scotland there are chapels quite distinct from the Scotch episcopal church, where clergymen who have been ordained either in England or Ireland, make use of the liturgy of the church of England; but as each of these is strictly and properly independent of the rest, and under the guardianship of no bishop whatever, those who attend them have, in every sense of the word, a much better claim to the appellation of *congregationalists* than to that of *episcopalians*.

EPISCOPAL, something belonging to BISHOPS.

EPISCOPALIANS, in church history, an appellation given to those who prefer the episcopal government and discipline to all others. See EPISCOPACY.

By the test act, none but Episcopalian, or members of the church of England, are qualified to enjoy any office civil or military.

EPISCOPIUS, SIMON, one of the most learned men

Episcopus
||
Epistle.

men of the 17th century, and the chief supporter of the Arminian sect, was born at Amsterdam in 1583. In 1612, he was chosen divinity professor at Leyden, in the room of Gomarus, who resigned; and the functions of his office, with his private studies, were light burdens to him, compared with the difficulties he sustained on account of the Arminian controversy: which, though it began in the universities, soon flew to the pulpits, from whence it spread and inflamed the people. The states of Holland having invited Episcopius to take his place at the synod of Dort, he went thither accompanied by some remonstrant ministers; but the synod would not allow them to sit as judges, nor to appear in any other capacity than as persons summoned before them: they submitted, were deposed from their functions, and banished the territories of the commonwealth. Episcopius and his persecuted brethren retired to Antwerp; but the times growing more favourable, he returned to Holland in 1626, and was made minister of the church of the Remonstrants at Rotterdam: in 1634 he was chosen rector of the college founded by the sect at Amsterdam, where he spent the remainder of his days. He died in 1643 of the same disorder which had killed his wife before, a retention of urine; having lost his sight some weeks previous to his end. The learned have bestowed great eulogiums on Episcopius; but he did not always write with that moderation which might have been wished. His works make two volumes in folio, of which the second consists of posthumous publications.

EPISCOPUS, the same with bishop. See BISHOP and EPISCOPACY.

EPISODE, in *Poetry*, a separate incident, story, or action, which a poet invents, and connects with his principal action, that his work may abound with a greater diversity of events; though, in a more limited sense, all the particular incidents whereof the action or narration is compounded are called *episodes*. See POETRY.

EPISPASTIC, in *Medicine*, a topical remedy, which being applied to the external parts of the body, attracts the humours to that part.

EPISTATES, in the Athenian government, was the president of the proedri. See PROEDRI.

EPISTEMONARCH, in the ancient Greek church, an officer of great dignity, who had the care of every thing relating to faith, in the quality of censor. His office answered pretty nearly to that of master of the sacred palace at Rome.

EPISTLE, denotes the same with a missive letter; but is now chiefly used in speaking of ancient writings, as the epistles of St Paul, epistles of Cicero, epistles of Pliny, &c.

Epistles and Gospels, in the liturgy of the church of England, are select portions of scripture, taken out of the writings of the evangelists and apostles, and appointed to be read, in the communion service, on Sundays and holidays. They are thought to have been selected by St Jerome, and by him put into the lectionary. It is certain, they were very anciently appropriated to the days whereon we now read them, since they are not only of general use throughout the western church, but are also commented upon in the homilies of several ancient fathers, which are said to have been

preached upon those very days to which these portions of scripture are now affixed.

The epistles and gospels are placed in an admirable order and method, and bear a special relation to the several days whereon they are read. The year is distinguished into two parts; the first being designed to commemorate Christ's living among us, the other to instruct us to live after his example. The former takes in the whole time from Advent to Trinity-Sunday; the latter, all the Sundays from Trinity to Advent. During the first of these seasons, the epistles and gospels are calculated to raise in us a grateful sense of what our Saviour did and suffered for us, and set before our eyes his nativity, circumcision, and manifestation to the Gentiles; his doctrines and miracles; his baptism, fastings, and temptation; his agony and bloody sweat; his cross and passion; his death, burial, resurrection, and ascension; and his mission of the Holy Ghost. During the second season of the year, the epistles and gospels tend to instruct us in the true paths of Christianity. See COLLECTS.

EPISTOLARY, something belonging to an epistle, see EPISTLE.

EPISTOLARY Compositions. See LETTER; and the article POETRY.

EPISTROPHE. See ORATORY.

EPISTYLE, in the ancient architecture, a term used by the Greeks for what we call *architrave*, viz. a massive piece of stone or wood, laid immediately over the capital of a column.

EPITAPH (from *επι*, upon, and *ταφος*, sepulchre), a monumental inscription, in honour or memory of a person deceased. It has been disputed whether the ancient Jews inscribed epitaphs on the monuments of the dead; but be this as it will, epitaphs it is certain, of very ancient date, are found amongst them.—The Athenians, by way of epitaph, put only the name of the dead, with the epithet *καλός*, signifying "good," or *ήρως*, "hero," and the word *καίρει*, signifying their good wishes: The name of the deceased's father and his tribe were frequently added.—The Lacedemonians allowed epitaphs to none but those who had died in battle. The Romans inscribed their epitaphs to the *manes*, *dis manibus*; and frequently introduced the dead by way of prosopeia, speaking to the living; of which we have a fine instance, worthy the Augustan age, wherein the dead wife thus bespeaks her surviving husband:

*Immatura peri; sed tu, felicior, annos
Vive tuos, conjux optime, vive meos.*

The epitaphs of the present day are generally crammed with fulsome compliments which were never merited, characters which human nature in its best state could scarce lay claim to, and expressions of respect which were never paid in the life-time of the deceased. Hence the proverb with great propriety took its rise, "He lies like an epitaph."

EPIGRAPH, is also applied to certain eloges, either in prose or in verse, composed without any intent to be engraven on tombs; as, that of Alexander,

Sufficit huic tumulus, cui non sufficeret orbis.

and that of Newton,

Isaacum

Epistolary
||
Epitaph.

Epitafis
||
Epitropus.

Isaacum Newton,
Quem immortalem
Testantur Tempus, Natura, Cælum;
Mortalem hoc marmor
Fatetur.

Epizexis
||
Epulares.

EPITASIS, in ancient poetry, the second part or division of a dramatic poem, wherein the plot, entered upon in the first part or *protasis*, was carried on, heightened, and worked up, till it arrived at its state or height, called *catastasis*.

EPITASIS, in *Medicine*, the increase of a disease or beginning of a paroxysm, particularly in a fever.

EPITHALAMIUM, in *Poetry*, a nuptial song or composition in praise of the bride and bridegroom, praying for their prosperity, for a happy offspring, &c.

Epithalamia were sung amongst the Jews, at the door of the bride, by her friends and companions, the evening before the marriage. Psalm xlv. is an epithalamium. Among the Greeks the epithalamium was sung as soon as the married couple were gone to bed, and attended with shouts and stamping of the feet to drown the cries of the bride. They returned in the morning, and with the same song, a little altered, saluted them again. The evening song was called *επιδαλαμια κοιμησια*, the morning salute was called *επιδαλαμια ενεργητικα*. This was the practice amongst the Romans also, but their epithalamia were often obscene.

EPITHEM, in *Pharmacy*, a kind of fomentation, or remedy of a spirituous or aromatic kind, applied externally to the regions of the heart, liver, &c. to strengthen and comfort the same, or to correct some intemperature thereof.

EPITHET, in *Poetry* and *Rhetoric*, an adjective expressing some quality of a substantive to which it is joined; or such an adjective as is annexed to substantives by way of ornament and illustration, not to make up an essential part of the description. Nothing, says Aristotle, tires the reader more than too great a redundancy of epithets, or epithets placed improperly; and yet nothing is so essential in poetry as a proper use of them. The writings of the best poets are full of them.

EPITOME, in literary history, the same with **ABRIDGEMENT**.

EPITRITUS, in prosody, a foot consisting of three long syllables and one short. Of these, grammarians reckon four kinds: the first consisting of an iambus and spondee, as *fālūtāntēs*; the second, of a trocheus and spondee, as *cōncītātī*; the third of a spondee, and an iambus, as *cōmmūnicāns*; and the fourth, of a spondee and trocheus, as *incāntārē*. See the articles **SPONDEUS**, **TROCHEUS**, &c.

EPITROPE. See **ORATORY**, N° 83.

EPITROPUS, a kind of judge, or rather an arbitrator, which the Greek Christians, under the dominion of the Turks, elect in the several cities, to terminate the differences that arise among them, and avoid carrying them before the Turkish magistrates. See **ARBITRATOR**.

Anciently the Greeks used the term *επιτροπος*, in the same sense as the Latins did *procurator*, viz. for a commissioner or intendant. Thus the commissioners of provisions in the Persian army are called by Herodotus and

Xenophon *epitropi*. In the New Testament, *επιτροπος* denotes the steward of a household, rendered in the vulgate *procurator*.

EPIZEUXIS. See **ORATORY**, N° 68.

EPOCHA, in *Chronology*, a term or fixed point of time whence the succeeding years are numbered or counted. See **ÆRA**.

EPODE, in lyric poetry, the third or last part of the ode, the ancient ode being divided into strophe, antistrophe, and epode. See **ODE**, &c.

The epode was sung by the priests, standing still before the altar, after all the turns and returns of the strophe and antistrophe, and was not confined to any precise number or kind of verses.

The epode is now a general name for all kinds of little verses that follow one or more great ones, of what kind soever they be; and in this sense a pentameter is an epode after an hexameter. And as every little verse, which, being put after another, closes the period, is called *epode*; hence the sixth book of Horace's odes is intitled *liber epodon*, "book of epodes," because the verses are all alternately long and short, and the short ones generally, though not always, close the sense of the long one.

EPOPOEIA, in *Poetry*, the history, action, or fable, which makes the subject of an epic poem. The word is derived from the Greek *επος*, *carmen*, "verse;" and *ποιω*, *facio*, "I make."

In the common use of the word, however, *epopœia* is the same with *epos*, or epic poem itself. See the article **POETRY**.

EPOPS, or **HOOPOE**. See **UPUPA**, **ORNITHOLOGY** *Index*.

EPSOM, a town of Surry, about 16 miles south-west from London, long famous for its mineral waters. These were discovered in 1618; and though not in such repute as formerly, yet they are not impaired in virtue, and the salt made from them is famous all over Europe, for gently cleansing and cooling the body. The hall, galleries, and other public apartments, are now run to decay; and there remains only one house on the spot, which is inhabited by a countryman and his wife, who carry the waters in bottles to the adjacent places, and supply the demands of dealers in London. On the neighbouring downs are annually horse-races; but the inns, shops, and bowling-greens are not near so much frequented as formerly. The market is on Friday; fair, July 25. The town is about one mile and a half in semicircle, from the church to the palace at Durdans, which was burnt down some years since, but has been rebuilt. It was once inhabited by his present majesty's father. In Hudson's Lane here was Epfom Court, an ancient Saxon seat, long since converted into a farm. Here are so many fields, meadows, orchards, gardens, and the like, that a stranger would be at a loss to know whether this was a town built in a wood, or a wood surrounded by a town.

Epsom water is easily imitated by art; i. e. by only dissolving half an ounce of Epfom salt in a quart of pure water, made somewhat brisk or quick by adding a little sulphuric acid and potash, so as to let the alkali prevail.

EPULARES, in antiquity, an epithet given to those who were admitted to the sacred *epulæ* or entertainments,

Epulo
||
Equator.

tainments, it being unlawful for any to be present at them who were not pure and chaste.

EPULO, in antiquity, the name of a minister of sacrifice among the Romans.

The pontifices, not being able to attend all the sacrifices performed at Rome to so many gods as were adored by that people, appointed three ministers, whom they called *epulones*, because they conferred on them the care and management of the *epula*, feasts in the solemn games and festivals. To them belonged the ordering and serving the sacred banquet, offered on such occasions to Jupiter, &c. They wore a gown bordered with purple like the pontifices. Their number was at length augmented from three to seven, and afterwards by Cæsar to ten. Their first establishment was in the year of Rome 558, under the consulate of L. Furius Purpureo and M. Claudius Marcellus.

EPULUM, in antiquity, a holy feast prepared for the gods in times of public danger. The feast was sumptuous, and the gods were formally invited and attended; for the statues were brought on rich beds furnished with soft pillows, called *pulvinaria*: Thus accommodated, their godships were placed on their couches at the most honourable part of the table. The care of the *epula* belonged to the *epulones*, and the gods were plentifully served with the richest dainties, as if they were able to eat; but the *epulones* performed that function for them, and doubtless were competent proxies! No wonder that Pliny solicited Trajan to be admitted of their order.

EPULUM is also used to signify any solemn feast; for we meet with *epulum ferale*, "a funeral entertainment."

EQUABLE, an appellation given to such motions as always continue the same in degree of velocity, without being either accelerated or retarded.

EQUAL, a term of relation between two or more things of the same magnitude, quantity, or quality.

Mathematicians speak of *equal* lines, angles, figures, circles, ratios, solids.

EQUALITY, that agreement between two or more things, whereby they are denominated equal.

EQUANIMITY, in *Ethics*, denotes that even and calm frame of mind and temper, under good or bad fortune, whereby a man appears to be neither puffed up nor overjoyed with prosperity, nor dispirited, soured, or rendered uneasy by adversity.

EQUATIONS, in *Algebra*. See ALGEBRA.

EQUATION of Time, in *Astronomy* and *Chronology*, the reduction of the apparent time or motion of the sun, to equable, mean, or true time. See ASTRONOMY Index.

EQUATOR, or ÆQUATOR, in *Astronomy* and *Geography*, a great circle of the sphere, equally distant from the two poles of the world, or having the same poles with those of the world. It is called the *equator*, because when the sun is in it the days and nights are *equal*; whence also it is called the *equinoctial*; and when drawn on maps and planispheres, the *equinoctial line*, or simply the *line*. Every point of the equator is a quadrant's distance from the poles of the world; whence it follows, that the equator divides the sphere into two hemispheres, in one of which is the northern, and in the other the southern pole.

EQUATORIAL INSTRUMENT. See ASTRONOMY Equatorial Index.

EQUERY, or ECURY, a grand stable or lodge for horses, furnished with all the conveniences thereof; as stalls, manger, rack, &c. The word is formed from the French *escurie*, which signifies the same thing. Some again derive *escurie* from the Latin *scuria*, which not only denotes a place for beasts to be put up in, but also a grange or barn. But a more probable derivation is from *equile*, "a stable for horses," of *equus*, "horse." Some hold that the word *stable*, in propriety, relates only to bullocks, cows, sheep, hogs, &c. and *equery*, to horses, mules, &c.

A *simple equery* is that provided for one row of horses; a *double equery* that provided for two, with a passage in the middle, or two passages; the horses being placed head to head, as in the little equery at Versailles.

Under equery are sometimes also comprehended the lodgings and apartments of the equerries, grooms, pages, &c.

EQUERY (*escuyer*), is also an officer who has the care and management of the horses of a king or prince.

EQUERIES, or EQUERRIES, popularly called *Queeries*, are particularly used among us for officers of the king's stables, under the master of the horse, seven in number, who, when his majesty goes abroad, ride in the leading coach, are in waiting one at a time monthly, and have a table with the gentlemen ushers during the time, and a salary of 300l. a-year each. They used to ride on horseback by the coach side when the king travelled; but that being more expensive to them than necessary to the sovereign, it has been discontinued.

EQUERIES of the Crown Stable have that appellation, as being employed in managing and breaking the saddle-horses, and preparing them for the king's riding. These are two in number; the first having an annual salary of 256l. and the second 200l. whereof one is, or always should be, in close waiting at court; and when his majesty rides, holds the stirrup, while the master of the horse, or one of the equeries in his absence, assists in mounting him; and when his majesty rides, they usually attend him.

EQUES, in antiquity. See *EQUESTRIAN Order* and *EQUITES*.

EQUES Auratus, is used to signify a knight-bachelor, called *auratus*, q. d. *gilt*, because anciently none but knights might gild or beautify their armour or other habiliments of war with gold. In law this term is not used, but instead of it *miles*, and sometimes *chevalier*.

EQUESTRIA, among the Romans, a place in the theatre where the equites or knights sat.

EQUESTRIAN (*Equestris*), a term chiefly used in the phrase *equestrian statue*, which signifies a statue representing a person mounted on horseback. The word is formed of the Latin *eques*, "knight, horseman," of *equus*, "horse."

EQUESTRIAN Games, among the Romans, horse-races, of which there were five kinds, the *prodromus* or *plain horse-race*, the *chariot-race*, the *decurfory-race* about funeral piles, the *ludi sevirales*, and the *ludi neptunales*.

EQUESTRIAN Order, among the Romans, signified their

Equiangular
||
Equinox.

their knights or equites; as also their troopers or horsemen in the field; the first of which orders stood in contradistinction to the senators; as the last did to the foot, military, or infantry. Each of these distinctions was introduced into the state by Romulus.

EQUIANGULAR, in *Geometry*, an epithet given to figures whose angles are all equal: such are a square, an equilateral triangle, &c.

EQUIDISTANT, an appellation given to things placed at equal distances from some fixed point or place to which they are referred.

EQUILATERAL, in general, something that hath equal sides; as an equilateral triangle.

EQUILIBRIUM, in *Mechanics*, is when the two ends of a lever or balance hang so exactly even and level, that neither doth ascend or descend, but both keep in a position parallel to the horizon; which is occasioned by their being both charged with an equal weight.

EQUIMULTIPLES, in *Arithmetic* and *Geometry*, are numbers or quantities multiplied by one and the same number or quantity. Hence, equimultiples are always in the same ratio to each other as the simple quantities before multiplication; thus, if 6 and 8 are multiplied by 4, the equimultiples 24 and 32 will be to each other as 6 to 8.

EQUINOCTIAL, or **ÆQUINOCTIAL**, in *Astronomy*, a great and immoveable circle of the sphere, under which the equator moves in its diurnal motion.

The equinoctial or equinoctial line is ordinarily confounded with the equator: but there is a difference; the equator being moveable, and the equinoctial immoveable; and the equator being drawn about the convex surface of the sphere, but the equinoctial on the concave surface of the *magnus orbis*.

Whenever the sun in his progress through the ecliptic comes to this circle, it makes equal days and nights all around the globe; as then rising due east and setting due west, which he never does at any other time of the year. And hence the denomination from *æquus* and *nox*, "night," *quia æquat diem nocti*.

The equinoctial then is the circle which the sun describes, or appears to describe, at the time of the equinoxes; that is, when the length of the day is everywhere equal to that of night, which happens twice a year. See **EQUINOX**.

EQUINOCTIAL, in *Geography*. See **EQUATOR**.

The shadows of those who live under this circle are cast to the southward of them for one half of the year, and to the northward of them during the other half; and twice in a year, viz. at the equinoxes, the sun at noon casts no shadow, being in their zenith.

From this circle is the declination or latitude of places accounted in the degrees of the meridian.

EQUINOCTIAL Points, are the two points wherein the equator and ecliptic intersect each other: the one being in the first point of Aries, is called the *vernal point* or *equinox*; and the other in the first point of Libra, the *autumnal point* or *equinox*.

EQUINOCTIAL Dial, is that whose plane lies parallel to the equinoctial. See **DIAL**.

EQUINOX, or **ÆQUINOX**, in *Astronomy*, the time when the sun enters one of the equinoctial points.

The equinoxes happen when the sun is in the equinoctial circle; when of consequence the days are equal

to the nights throughout the world, which is the case twice a-year, viz. about the 20th of March and the 23d of September, the first of which is the vernal and the second the autumnal equinox.

It is found by observation, that the equinoctial points, and all the other points of the ecliptic, are continually moving backward, or in *antecedentia*, that is, westward. This retrograde motion of the equinoctial points, is that famous and difficult phenomenon called the *precession of the equinoxes*. See **ASTRONOMY Index**.

EQUIPAGE, in the military art, denotes all sorts of utensils, artillery, &c. necessary for commencing and prosecuting with ease and success any military operations. Camp and field equipage consists of tents, kitchen-furniture, saddle-horses, baggage, waggons, bat-horses, &c.

To **EQUIP**, in naval language, a term borrowed from the French marine, and frequently applied to the business of fitting a ship for sea, or arming her for war.

EQUIPOLLENCE, in *Logic*, is when there is an equivalence between any two or more terms or propositions; i. e. when they signify one and the same thing, though they express it differently. Such propositions, &c. are said to be *equipollent*.

EQUIRIA, in antiquity, a festival instituted by Romulus, and celebrated on the 27th of February, in honour of Mars, at which there were horse-races.

EQUISETUM, **HORSE-TAIL**: A genus of plants belonging to the cryptogamia class; and in the natural method ranking under the 51st order, *Coniferae*. See **BOTANY Index**.

EQUITES, amongst the Romans, were persons of the second degree of nobility, immediately succeeding the senators in point of rank. The *equites* or knights were required to be possessed of 400 *sestertia* before they could be admitted into that order; and when the knights were so reduced as to fall short of the prescribed revenue, they were expunged out of the equestrian list. The equestrian revenue just mentioned amounted to about 10,000 crowns.

Part of the ceremony whereby the honour of knight-hood was conferred amongst the Romans was the giving of a horse; for every *equus* or knight had a horse kept at the public charge, he received also the stipend of a horseman to serve in the wars, and wore a ring which was given him by the state. The *equites* composed a large body of men, and constituted the Roman cavalry; for there was always a sufficient number of them in the city, and nothing but a review was requisite to fit them for service.

The knights at last grew too powerful, were a balance for the senate and people, neglected the exercises of war, and betook themselves to civil employments. The *equites* were liable to be punished by the censors, and to suffer degradation. They were degraded by taking from them the horse which was kept for each of them at the public charge; this was called *equum adimere*.

EQUITY, in a general sense, the virtue of treating all other men according to reason and justice, or as we would gladly be treated ourselves when we understand aright what is our due. See **JUSTICE**.

EQUITY, in jurisprudence, is defined a correction or qualification of the law, generally made in that part wherein it faileth or is too severe. It likewise signifies the

Equipage
||
Equity.

Equity
||
Equivoca-
tion.

the extension of the words of the law to cases unexpressed, yet having the same reason; so that where one thing is enacted by statute, all other things are enacted that are of the like degree. For example, the statute of *Glouc.* gives action of waste against him that holds lands for life or years; and by the equity thereof, a man shall have action of waste against a tenant that holds but for one year, or one half-year, which is without the words of the act, but within the meaning of it; and the words that enact the one, by *equity* enact the other. So that equity is of two kinds. The one abridges and takes from the letter of the law; the other enlarges and adds to it: and statutes may be construed according to equity, especially where they give remedy for wrong, or are for expedition of justice. Equity seems to be the interposing *law of reason*, exercised by the lord chancellor in extraordinary matters to do equal justice; and by supplying the defects of the law, gives remedy in all cases. See CHANCERY.

EQUITY, in *Mythology*, sometimes confounded with *Justice*, a goddess among the Greeks and Romans, represented with a sword in one hand and a balance in the other.

EQUIVALENT, is understood of something that is equal in value, force, or effect, to another.

Equivalence is of various kinds, in propositions, in terms, and in things.

EQUIVALENT Propositions. See EQUIPOLLENCE.

EQUIVALENT Terms, are where several words that differ in sound have yet one and the same signification; as *every body was there*, and *nobody was absent*, *nihil non*, and *omne*.

EQUIVALENT Things, are either *moral*, *physical*, or *statical*. *Moral*, as when we say that the commanding or advising a murder is a guilt equivalent to that of the murderer. *Physical*, as when a man who has the strength of two men is said to be equivalent to two men. *Statical*, whereby a less weight becomes of equal force with a greater, by having its distance from the centre increased.

EQUIVOCAL TERMS or WORDS, among logicians, are those which have a doubtful or double meaning.

According to Mr Locke, the doubtfulness or uncertainty of words has its cause more in the ideas themselves, than in any incapacity of the words to signify them; and might be avoided, would people always use the same term to denote the same idea or collection of ideas: but, adds he, it is hard to find a discourse on any subject where this is the case; a practice which can only be imputed to folly or great dishonesty; since a man, in making up his accounts, might with as much fairness use the numerical characters sometimes for one sometimes for another collection of units.

EQUIVOCAL Generation, the production of animals without the intercourse between the sexes, by the influence of the sun or stars, &c.

This kind of generation is now quite exploded by the learned.

EQUIVOCATION, the using a term or expression that has a double signification. Equivocations are expedients to save telling the truth, and yet without telling a falsity. The fathers are great patrons of equivocations and mental reservations, holding that the use of such shifts and ambiguities is in many cases allowable.

EQUULEUS, or ECCULEUS, in antiquity, a kind of rack used for extorting a confession; at first chiefly practised on slaves, but afterwards made use of against the Christians. Equuleus
||
Erasmus.

The equuleus was made of wood, having holes at certain distances, with a screw by which the criminal was stretched to the third, sometimes to the fourth or fifth holes, his arms and legs being fastened on the equuleus with cords; and thus was hoisted aloft, and extended in such a manner, that all his bones were dislocated. In this state red-hot plates were applied to his body, and he was goaded in the sides with an instrument called an *ungula*.

EQUULEUS, EQUICULUS, and *Equus Minor*, the horse's head, in *Astronomy*, a constellation of the northern hemisphere, whose stars in Ptolemy's catalogue are four, in Tycho's four, in Hevelius's six, and in Mr Flamsteed's ten.

EQUUS, a genus of quadrupeds belonging to the class mammalia, and order of belluæ. See MAMMALIA *Index*. And for the diseases of the horse, see FARRIERY *Index*.

ERA, in *Chronology*. See ÆRA.

ERANARCHA, a public officer among the ancient Greeks, whose business was to preside over and direct the alms and provisions made for the poor. Cornelius Nepos, in his life of Epaminondas, describes his office thus: When any person was reduced to poverty, taken captive, or had a daughter to marry, which he could not effect for want of money, &c. the eranarcha called an assembly of friends and neighbours, and taxed each according to his means and estate, to contribute towards his relief.

ERANTHEMUM, a genus of plants belonging to the diandria class. See BOTANY *Index*.

ERASISTRATUS, a celebrated physician, grandson to the philosopher Aristotle. He discovered by the motion of the pulse the love which Antiochus had conceived for his mother-in-law Stratonice, and was rewarded with 100 talents for the cure by the father of Antiochus. He was great enemy to bleeding and violent physic.

ERASMUS, DESIDERIUS, born at Rotterdam in 1467. He lost his father and mother at 14 years of age; and was committed to the care of a certain guardians, who would force him to be an ecclesiastic, which he refused for a long time. However, he was obliged to assume the religious habit among the canons regular in the monastery of Stein near Tergou; but afterwards obtained a dispensation from his vows. He was the most learned man of the age in which he lived; and contributed, by his example and his writings, to the restoration of learning in the several countries in which he occasionally resided, viz. Italy, Switzerland, Holland, France, and England: with the last, he was most satisfied; and found the greatest encouragement from Henry VIII. Sir Thomas More, and all the learned Englishmen of those days. He published a great many books; and died at Basil in 1536. He was buried honourably, and his memory is still held in veneration. He had, however, many enemies; and as he did not embrace the reformation, and yet censured many things in popery, he hath been treated injuriously both by Catholics and Protestants. The works of Erasmus in 10 vols folio were published at Leyden in

Erastians ||
Erection. in 1706, in a very handsome manner, under the care of M. le Clerc. Dr Jortin published his life in one vol. 4to, 1758.

ERASTIANS, a religious sect or faction which arose in England during the time of the civil wars in 1647, thus called from their leader Thomas Erastus, whose distinguishing doctrine it was, that the church had no right to discipline, that is, no regular power to excommunicate, exclude, censure, absolve, decree, or the like.

ERATO (from *εραω*, I love), in *Mythology*, the name of one of the nine muses, who presided over love-poetry. To this muse some have ascribed the invention of the lyre and lute; and she is represented with a garland of myrtles and roses, holding a lyre in one hand and a bow in the other, and at her side a Cupid with his torch. There is also a Nereid of the same name.

ERATOSTHENES, a Cyrenæan philosopher, historian, and poet; called for his learning *Plato Minor*. He was keeper of the famous library at Alexandria; and was greatly in favour with Ptolemy Euergetes, by whose order he wrote a history of the Theban kings of Egypt, which succession was entirely omitted by Manetho. He thus fixed the Egyptian chronology, and his authority is by many preferred to that of Manetho. He wrote many other things, a catalogue of which is to be seen in Fabricius, Vossius, &c. but his only piece now remaining entire is a description and fabulous account of the stars. He starved himself in old age through grief for the dimness of his sight, about the 10th or 12th year of Ptolemy Epiphanes, 194 B. C.

ERATOSTRATUS, an Ephesian who burnt the famous temple of Diana the same night that Alexander the Great was born. This burning, as some writers have observed, was not prevented or seen by the goddess of the place, who was then present at the labour of Olympias, and at the birth of the conqueror of Persia. Eratosthratus did this villany merely to eternize his name by so uncommon an action.

EREBUS (*Ερεβος*, from *ερα*, night), in *Mythology* a term denoting darkness. According to Hesiod, Erebus was the son of Chaos and the night, and the father of the day. This was also the name of part of the *inferi* among the ancients: they had a peculiar expiation for those who were detained in Erebus.

Erebus was properly the gloomy region, and distinguished both from Tartarus the place of torment, and Elysium the region of bliss: according to the account given of it by Virgil, it forms the third grand division of the invisible world beyond the Styx, and comprehends several particular districts, as the *limbus infantum*, or the receptacle for infants; the *limbus* for those who have destroyed themselves; the fields of mourning, full of dark groves and woods, inhabited by those who died for love; and beyond these, an open champaign country for departed warriors.

ERECTION, in a general sense, the art of raising or elevating any thing; as the erection of a perpendicular, &c. It is also used in a figurative sense; as the erection of a bishop, marquisate, &c.

ERECTION is particularly used by medical writers for the state of the penis when swelled and distended by the action of the muscles called *erectores*. See *ANATOMY Index*.

VOL. VIII, Part I.

There is also an erection of the clitoris, which is performed by muscles for that purpose.

EREMIT. See **HERMIT**.

ERETRIA, in *Ancient Geography*, a town of Eubœa, situated on the Euripus, in the south-west of the island. A very ancient city, and the largest of the island, after Chalcis. After being demolished by the Persians, it was restored on an adjoining spot, according to Strabo, who mentions a school of Etrian philosophers there. The Abantes of Homer were of Eubœa.

ERFORD, a town of Germany, in the circle of Upper Saxony, the capital of Thuringia, and subject to the elector of Mentz. It is defended by good ramparts; and has a castle on an eminence, which commands the town. Its inhabitants are almost all Lutherans, but its principal churches belong to the Catholics. There are several handsome structures, both public and private; but the houses in general are but indifferently built. E. Long. 11. 14. N. Lat. 50. 49.

ERGASTULUM, among the Romans, was a prison, work-house, or house of correction, where slaves by the private authority of their masters were confined and kept for their offences to hard labour. The Greeks had a place of confinement of this sort called *Σωφρονιστειον*.

ERGÔT, in *Farriery*, is a stub, like a piece of soft horn, about the bigness of a chestnut, placed behind and below the pastern joint, and commonly hid under the tuft of the fetlock. See *FARRIERY Index*.

ERICA, HEATH, a genus of plants belonging to the octandria class, and in the natural method ranking under the 18th order, *Bicornes*. See *BOTANY Index*.

ERIDANUS, in *Ancient Geography*, a river of Attica, falling into the Ilissus.—Another Eridanus, the more ancient name of the Padus, an appellation ascribed by Pliny to the Greeks; followed in this by Virgil. It rises in Mount Vesulus, in the Alpes Cotticæ, and dividing the Cisalpine Gaul into the Cispadana and Transpadana, and swelled on each hand with no inconsiderable rivers from the other Alps and the Apennine, falls at seven mouths into the Adriatic. Famous in mythology, from the story of Phaëton; whose sisters, the Heliades, were here changed into poplars, according to Ovid.

ERIDANUS, in *Astronomy*, a constellation of the southern hemisphere, in form of a river.—The stars in the constellation Eridanus, in Ptolemy's catalogue, are 34; in Tycho's, 19; and in the British catalogue, 84.

ERIE, a vast lake to the westward of Pennsylvania, in North America, situated between 80° and 87° W. Long. and between 41° and 42° N. Lat.

ERIGENA, or **SCOTUS**, JOHN, a famous scholastic divine, born about the beginning of the ninth century; but where, is a matter of dispute among authors. Bale and Pits says he was born at St David's in Wales; Dempster, Mackenzie, and Henry, that he was born at Ayr in Scotland; which they infer from his names *Erigena* and *Scotus*, by the latter of which he was generally distinguished by his cotemporary writers. But Du Pin and Sir James Ware assert that he was by birth an Irishman; Ireland being in those days called *Scotia*,

L I

and

Eremit ||
Erigena.

Erigena. and by the natives *Erin*. They agree, however, in relating that he travelled to Athens, where he acquired a competent knowledge of the Greek and other oriental languages; and that he afterwards resided many years in the court of Charles the Bald, king of France, who, on account of his singular abilities, treated him as his intimate friend and companion. He slept frequently in the royal apartment; and was constantly admitted to the king's table. "We may judge (says a modern historian) of the freedom which he used with Charles, by the following repartee. As the king and Scotus were sitting one day at table, opposite to each other, after dinner, drinking a cheerful glass, the philosopher having said something that was not quite agreeable to the rules of French politeness, the king in a merry humour asked him, Pray what is between a Scot and a sot? To which he answered, "Nothing but the table." See *Henry's History of Great Britain*, vol. i. p. 344. who quotes this story from *Hoveden's Annal. ad an. 86*. Quer. What language were they talking when this *bon mot* was uttered?

During his residence with Charles, he wrote several books of scholastic divinity; which, though absurd enough, were at that time not sufficiently so to secure him from the imputation of heterodoxy; and on that account the pope commanded Charles the Bald to send him to Rome; but the king had too great a regard for his companion to trust him with his Holiness. One of the chief controversies in which Scotus was engaged, and with which the pope was much offended, was concerning the real presence and blood of Christ in the wafer. His opinion of this weighty matter is expressed in these few words: "What we receive corporally is not the body of our Lord; but that which feeds the soul, and is only perceived by faith." He was also engaged in two other controversies of equal importance, but of a somewhat less delicate nature. The first was, Whether any part of the eucharist be evacuated by stool? and the second, Whether Christ was born of the Virgin Mary *aperta vulva*; Paschasius was of opinion, that this could not be without some injury to her perpetual virginity; and therefore believed that Christ came into the world *per vulvam clausam*, as he came into the place where his disciples were assembled, through the door and not through the wall, without opening the door. Concerning the first of these delicate questions, Scotus with several others declared, that part of the eucharist was certainly evacuated by stool; for which they were honoured with the appellation of *Stercorists*. And as to the second question, he said, that the *vulva clausa* was a dangerous opinion: for it would thence follow, that he was not born, but issued; *non est nasci, sed erumpi*. See Mackenzie, vol. i. p. 55.

Whether this John Scotus returned to England, or ended his days in France, is a matter of doubt. Some of our historians tell us, that he left France in the year 864; and that, after residing about three years in Oxford, he retired to the abbey of Malmesbury, where his scholars stabbed him with their pen knives. There is no foundation for this story. Probably he died about the year 874; but whether in France or England, is uncertain, and of little importance. Some have related, that he was invited to England by King

Alfred: but in this they confound him with John, abbot of Etheling, who was assassinated in 895; and to this mistake the various accounts concerning this author are to be attributed. Regardless of his history, he appears from his writings to have been a man of parts, and, in point of learning, superior to any of his contemporaries. He wrote, 1. *De divisione naturæ*, lib. v. 2. *De prædestinatione Dei*. 3. *Excerpta de differentiis & societatibus Græci Latiniq; verbi*. 4. *De corpore et sanguine Domini*. 5. *Ambigua S. Maximi, seu scholia ejus in difficiles locos S. Gregorii Nazianzeni, Latine versa*. 6. *Opera S. Dionysii quatuor in Latinam ling. conversa*. All published. 7. *De visione Dei*, and several other works, in manuscript, preserved in different libraries.

ERIGERON, FLEA-BANE, a genus of plants, belonging to the syngenesia class; and in the natural method ranking under the 49th order, *Compositæ*. See *BOTANY Index*.

ERIGONE, in fabulous history, daughter to Icarus, died of grief for her father's death, was translated into heaven, and makes the sign Virgo.

ERINACEUS, or HEDGE-HOG, a genus of quadrupeds belonging to the order of fera, in the class mammalia. See *MAMMALIA Index*.

ERINGO. See *ERYNGIUM*, *BOTANY Index*.

ERINUS, a genus of plants belonging to the didymia class; and in the natural method ranking under the 40th order, *Personatæ*. See *BOTANY Index*.

ERIOCAULON, a genus of plants, belonging to the triandria class; and in the natural method ranking with the sixth order, *Ensatæ*. See *BOTANY Index*.

ERIOCEPHALUS, a genus of plants, belonging to the syngenesia class; and in the natural method ranking under the 49th order, *Compositæ*. See *BOTANY Index*.

ERIOPHORUM, a genus of plants, belonging to the triandria class; and in the natural method ranking under the third order, *Calamariæ*. See *BOTANY Index*.

ERITHALIS, a genus of plants, belonging to the pentandria class; and in the natural method ranking with those of which the order is doubtful. See *BOTANY Index*.

ERIVAN, a city of Persia, in Asia, and capital of Persian Armenia. It is a large, dirty, ill-looking place, in which are no handsome buildings, the houses being very mean, and raised with earth or mud; but it is full of gardens and vineyards. It is situated in a plain which is surrounded on all sides with mountains. Two rivers pass near it, the Zengui to the north-west, and the Queur Boulac to the south-west. The fortress may pass for a town of itself; it is of an oval form, and is four miles in circumference, containing about 800 houses. It is inhabited by none but the native Persians. The Armenians have shops in it, where they work and trade in the day time, but at night return to their habitations in the city. The fortress is surrounded with three walls, made with bricks dried in the sun, which have battlements, and are flanked with towers, and defended with ramparts. On the north-east there is a dreadful precipice, above 200 yards in depth, at the bottom of which the river runs. The garrison usually consisted of 2000 men; but how many there are since the revolution is hard to say. The palace of the governor of the province is within the fortress. The city

Eriphyle
||
Ermin.

is about a cannon's shot distant from the fortress, and the space between is full of houses and markets. E. Long. 44. 50. N. Lat. 40. 20.

ERIPHYLE, in fabulous history, a sister of Adrastus king of Argos, who married Amphiarus. She was daughter of Talauus and Lifimache. When her husband concealed himself that he might not accompany the Argives in their expedition against Thebes, where he knew he was to perish, Eriphyle suffered herself to be bribed by Polynices with a golden necklace which had been formerly given to Hermione by the goddess Venus, and she discovered where Amphiarus was. This treachery of Eriphyle compelled him to go to the war; but before he departed, he charged his son Alcmaeon to murder his mother as soon as he was informed of his death. Amphiarus perished in the expedition; and his death was no sooner known than his last injunctions were obeyed, and Eriphyle was murdered by the hands of her son.

ERIS, the goddess of discord among the Greeks. She is the same as the *Discordia* of the Latins.

ERISICHTHON, in fabulous history, a Thessalian, son of Triops, who derided Ceres and cut down her groves. This impiety irritated the goddess, who afflicted him with continual hunger. He squandered all his possessions to gratify the cravings of his appetite, and at last he devoured his own limbs for want of food. Some say that his daughter had the power of transforming herself into whatever animal she pleased, and that she made use of that artifice to maintain her father, who sold her, after which she assumed another shape, and became again his property.

ERMIN. See MUSTELA, MAMMALIA Index.

ERMIN, or *Ermine*, in *Heraldry*, denotes a white field or fur, powdered or interspersed with black spots, called *powdering*. It is supposed to represent the skin of an animal of the same denomination. There is however no animal whose skin naturally corresponds to the herald's ermin.

The animal is milk white; and so far is it from having spots, that tradition reports, that it will rather die or be taken than sully its whiteness. Whence its symbolical use.

But white skins having for many ages been used for the linings of the robes of magistrates and great men; the furriers at length, to add to their beauty, used to sew bits of the black tails of those creatures upon the white skins, to render them the more conspicuous. Which alteration was introduced into armoury.

The sable spots in ermin are not of any determinate number, but they may be more or less at the pleasure of the painter or furrier.

ERMIN, an order of knights, instituted in 1450 by

Francis I. duke of Bretagne, and formerly subsisting in France. The collar of this order was of gold, composed of ears of corn in saltier; at the end of which hung the ermin, with this inscription, *à ma vie*. But the order expired when the dukedom of Bretagne was annexed to the crown of France.

ERMINEs, in *Heraldry*, the reverse of ermine, i. e. white spots on a black field.

ERMINITES, in *Heraldry*, should signify little ermines, but it is otherwise; for it signifies a white field powdered with black, only that every such spot hath a little red hair on each. Erminites also signify a yellow field powdered with black, which the French express much better by *or semée d'ermine de sable*.

ERMINOIS, in *Heraldry*, signifies the field or, and the spots black.

EROORO. See ALCEDO, ORNITHOLOGY Index.

EROS, (of *ερος* "love"), in *Mythology*, one of two chiefs over all the other Cupids, being the cause of love. See ANTEROS.

EROTIA, a festival in honour of Eros the god of love. It was celebrated by the Thespians every fifth year with sports and games, when musicians and others contended. If any quarrels or seditions had arisen among the people, it was then usual to offer sacrifices and prayers to the god, that he would totally remove them.

EROTIC (derived from *ερος* "love;" whence *ερωτιμος*), is applied to any thing which has a relation to the passion of love.

In medicine we find the phrase *delirium eroticum* used for a kind of melancholy contracted through excess of love.

EROSION, among physicians, denotes much the same with CORROSION, only in a stronger degree.

EROTESIS. See ORATORY, N° 94.

ERPENIUS, THOMAS, in Dutch THOMAS of ERPE, a celebrated professor of the Arabic language, was born at Gorcum in Holland in 1584, and educated at Leyden. He applied himself to the oriental languages at the persuasion of Joseph Scaliger; and afterwards travelled into England, France, Italy, and Germany, and everywhere obtained the esteem of the learned. On his return to Holland, he was made professor of Arabic in the university of Leyden, and died there in 1624. He published a great many excellent works, which spread his reputation through the whole learned world. It is said, that the king of Morocco admired so greatly the letters of Erpenius wrote to him in Arabic in the name of the United Provinces, that he could not cease reading them, and showing them to those who spoke that language naturally.

Ermines
||
Erpenius.

E R P E T O L O G Y .

INTRODUCTION.

THE animals of which we propose, under the general title *Erpetology*, to give the classification and natural history, belong to the class *Amphibia*, and the order *Reptilia*, in the Linnæan arrangement. The ani-

mals included under this class have obtained the denomination of amphibious, from the supposed circumstance that they are equally capable of living, both on land and in the water. But in this view, the application of the term is inaccurate, for there are few, or perhaps no animals belonging to this class which can always exist,

or even perform the functions of life for any considerable length of time, in the water. Many of them, however, possess this faculty to a certain degree, and therefore, the name has been extended to all which are distinguished by the same peculiarity of external form, and a similar structure of internal organs.

Some naturalists have denominated this order of animals *oviparous quadrupeds*. This denomination is undoubtedly sufficiently characteristic; for although some species are viviparous, and in this circumstance, as well as being furnished with four feet, exhibit some resemblance with the higher order of quadrupeds, the striking difference which is discovered by the anatomist and the physiologist, affords unequivocal and decided marks of distinction. From the structure, habits, and general economy of this order of animals, we derive characters which are sufficiently distinctive between it and the class of birds, to which the term *oviparous* is strictly applicable. This denomination, therefore, which is also employed by the Count de la Cèpede, is sufficiently characteristic of the class of animals which are included under it.

The word *reptile*, by which this order of animals has been distinguished by Linnæus, seems not to be liable to much objection. All the individuals of which it is composed have very short legs, and these are placed at a great distance from each other, and so weak, that they are unable to support the weight of the body. The gray lizard, for instance, which is one of the most active of the tribe, is obliged to support itself on its belly, as soon as its progressive motion is greatly diminished; so that it employs its limbs rather for the purpose of crawling than that of walking. And indeed all the animals of the order, from the peculiar structure and disposition of their limbs, when their motions are slow, must drag the body along on the belly, other modifications of their locomotive powers depending only on the great length and relation of the instruments of motion. In this view, therefore, the Linnæan name of the order is not improperly applied to almost all the individuals which it comprehends.

The term *erpetology*, which we have given to this treatise upon the order *reptilia*, was formerly employed by the Swedish naturalist Klein, in a more extensive sense. Under this title he included the order *serpentes*, as well as that of *reptilia*, thus comprehending the whole class of *amphibia*. Here we have adopted it in a more limited acceptation, and confined its meaning to the last order, pursuing the plan of M. Bonnaterre, in his arrangement of the same order of animals in the *Encyclopédie Methodique*.

Linnæus has adopted as a mark of distinction of this order of animals, the peculiar structure of the heart, which in the language of the anatomist is said to be *unilocular*, or furnished only with one ventricle or cavity. This doctrine has been admitted by eminent anatomists, as well as by some of the greatest physiologists, such as Boerhaave, Haller, and some others; and called in question only when some exceptions have occurred, of animals belonging to this tribe, which have exhibited somewhat of a different structure. One instance of this is quoted in the heart of an Indian inland tortoise, which was examined by the French academicians of the 17th century, and in which they discovered three ventricles instead of one. But other physiologists

are of opinion, that the heart of this order of animals is really furnished with two ventricles, having an immediate communication between them; they must therefore be considered as having a double heart.

The lungs of the order *reptilia* are, in their appearance and structure, widely different from those of other animals. They are in general composed of two large bladders, or membranaceous bags, which, in the different species are divided into a greater or smaller number of *cancelli*, or subdivisions; among which are distributed the pulmonary blood-vessels. These bear but a small proportion to the vesicular part through which the ramifications are carried; in this respect differing greatly from the lungs of the higher order of quadrupeds, or *mammalia*, in which the proportion of the blood-vessels is so much greater than that of the air-cells, that the lungs have more of a fleshy than of a membranaceous appearance. In this order of animals, therefore, in which the blood is cold, the vesicular system far overbalances the vascular; but in the class *mammalia*, which are warm-blooded animals, the vascular system prevails over the vesicular.

Of all the animals which occupy the surface of the earth, and which the Almighty Creator has dispersed throughout his works, to fill up the void of space, and to produce motion, the tribe of reptiles seems at first sight to have been least the objects of beneficence and wisdom. In their structure, habits, and mode of life, when compared with other orders of animals, they exhibit marks of degradation and neglect. The body in general presents only a rude inactive mass; their senses are extremely obtuse; their instincts are limited to the grossest sensations, and the extent of their enjoyments reaches only to the gratifications of appetite. On the boundaries of land and water, in those vast morasses, which are remarkable only for immense depositions of mud, few or scarcely any possess the graces or elegance of other terrestrial animals; like the latter they enjoy not the pleasure of associating together for amusement or defence, or of indulging in sportive tricks on the land, or in the air. On the contrary, they crawl on the earth, on the margin of extensive lakes, surrounded with unwholesome vapours; or they live in the cavities of the rocks, or in the midst of barren deserts, undisturbed by other animals, and far retired from the habitations of man. Some delight in exposing themselves to the rays of the sun; while others retire during the day to shady, moist, and sequestered places, proceeding from their retreats only during the night, as it were to conceal their deformity, and to spare man those feelings of fear, disgust, and horror, with which their presence inspires him. But as the study of every part of the long chain of beings is worthy of our attentive consideration and regard, these animals, in the eyes of the careful observer of nature, are far from being wanting in exciting his interest and curiosity. He cannot fail to be highly gratified with contemplating the resources which they derive from the peculiar structure of their external form, as well as from the nature of their functions. Their manners, their habits, and the relations which they bear to beings of a higher order, on the one hand, and the distance to which they are removed from brute matter on the other, are objects worthy of the contemplation of the naturalist. This study, properly directed and applied, unveils to our eyes the beneficent design

design and riches of creation, and raises our admiration to the wonderful and extensive variety of animated beings.

The uses of some of the animals belonging to this class, as valuable articles of food in those regions where they abound, or as furnishing the tables of the luxurious in other countries with a rich delicacy; the peculiarities of external form, and of internal structure, as well as of several of their functions, such as circulation and respiration; their great length of life; the reproductive power of some, and the long abstinence

which others can undergo, give additional interest and importance to the natural history of these animals.

In the following treatise, we propose to lay before our readers a brief but comprehensive view of the natural history of this order of animals; and for the sake of perspicuity we shall treat this subject under two general heads. We shall first consider the classification and natural history of the order *reptilia*; and secondly, we shall give a short sketch of their anatomy, with the principal facts connected with their physiology. These will form the subjects of the two following chapters.

CHAP. I. OF THE CLASSIFICATION AND NATURAL HISTORY OF REPTILES.

IN the Linnæan arrangement, the order *reptilia* is divided into four genera. Other naturalists have adopted a different arrangement. De la Cèpede, in his history of oviparous quadrupeds, has divided this order into two great classes. The first class includes those animals which are furnished with a tail, and the second comprehends those which have no tail. The following table exhibits a view of the classification of this eminent naturalist.

Class I. Animals furnished with a tail.

Genus 1. *Tortoises*, having the body covered with a bony shield.

Division 1. The fingers very unequal, and lengthened out in the form of fins.

Division 2. The fingers very short, and almost equal.

Genus 2. *Lizards*: the body having no bony covering.

Division 1. The tail flattened; five fingers on the fore feet.

Division 2. The tail round; five fingers on each foot, and elevated scales on the back.

Division 3. The tail round; five fingers on the fore feet; scaly bands under the belly.

Division 4. The tail round; five fingers on the fore feet, without scaly bands under the belly.

Division 5. The fingers furnished underneath with large scales, covering each other, like the slates on the roof of a house.

Division 6. Three fingers on the fore and the hind feet.

Division 7. Membranes in the form of wings.

Division 8. Three or four fingers on the fore feet; four or five fingers on the hind feet.

Class II. Animals which have no tail.

Genus 1. *Frogs*: the head and the body lengthened out, and the one or the other angular.

Genus 2. *Tree-frogs*: the body long, with soft viscid tubercles under the toes.

Genus 3. *Toads*: the body thick and round.

Appendix. Biped reptiles.

Division 1. Two fore feet.

Division 2. Two hind feet.

Of this arrangement it may be observed, that, although it exhibits much minuteness and ingenuity, the distinctive characters upon which some parts of it are founded, are not always constant and fixed; for it has been found that these characters vary in the different individuals in which they have been observed. This variety, it has been conjectured, arises from the difference of age, and peculiarities in their food and modes of life.

M. Bonnaterre has adopted a different arrangement. He has also divided the whole order of reptiles into two classes, as will appear from the following table.

Class I. Reptiles which have no tail.

Genus 1. *Frog*.

Genus 2. *Tree-Frog*.

Genus 3. *Toad*.

Class II. Reptiles which are furnished with a tail.

Genus 1. *Tortoise*.

Genus 2. *Chameleon*.

Genus 3. *Crocodile*.

Genus 4. *Lizard*.

Genus 5. *Flying dragon*.

Genus 6. *Salamander*.

Genus 7. *Chalcis*.

This arrangement is undoubtedly, in many cases, convenient and proper; yet, as there seems to be in others an unnecessary multiplication of genera, we shall still adhere to the Linnæan classification, which, though more simple, will in general be found not to be much less accurate; and the objects which it comprehends not being very numerous, it is sufficiently distinct. Linnæus divided this order into four genera. The following are the characters of the genera, of which we give a translation, for the accommodation of the English reader.

GENERIC CHARACTERS.

Genus I. TESTUDO. Corpus caudatum; lorica ossæ, aut coriacea superne et inferne, vel squamis superne obtectum. Oris mandibula superior inferiorem pyxidum instar claudens.

Genus I. TORTOISE. Body having a tail; covered above and beneath with a bony or coriaceous shell, or scales above. The upper jaw closing over the lower like the lid of a box.

Genus II.

Tortoises

Genus II. RANA. Corpus tetrapodum, nudum, ut plurimum ecaudatum : pedibus posterioribus longioribus.

Genus III. DRACO. Corpus tetrapodum, caudatum, alatum : alis propriis.

Genus IV. LACERTA. Corpus tetrapodum, elongatum, caudatum, nudum : pedibus æqualibus.

Genus II. FROG. Body four-footed, naked, generally without tail ; the hinder feet longest ; and without any integument but the skin.

Genus III. FLYING DRAGON. Body four-footed, furnished with a tail, and on each side with an expanfile wing-like skin.

Genus IV. LIZARD. Body four-footed, elongated, furnished with a tail, without any additional integument : legs equal.

Tortoises.

I. TESTUDO, or TORTOISE.

FROM the great similarity which prevails among several species, and the variety in size, colour, and other circumstances, according to the different periods of their age, considerable difficulties have arisen in discriminating them with precision. The observations of later naturalists have shown, that the specific characters of Linnæus are not sufficient for the purpose of accurate distinction ; nor have the descriptions of the Count de la Cèpede been more useful in furnishing proper characteristic marks. One set of characters, which have been usually employed for this purpose, it has been observed by Mr Schoepff, ought not to be trusted. They are derived from the number of claws on the feet of marine tortoises, or turtles. These, however, are found to vary so much, that they are not to be considered as affording uniform and constant characters of distinction. As a proof of this observation, if different individuals of the common green turtle (*testudo midas*), be compared together, it will appear that some have only a single claw on each foot ; while others are furnished with two, and sometimes three ; sometimes with two on the fore feet, and with one on the hind feet. Similar variations have also been observed in the number of claws of land tortoises, and particularly in those of the common tortoise, (*testudo græca*) ; in some individuals of which the fore feet have four, and in others five claws. Avoiding, therefore, these uncertain and varying characters, the shape, pattern, colours of the shell, and form of the head, Dr Shaw observes, furnish the most accurate marks of distinction.

Some of the species belonging to this genus are natives of the ocean ; some are confined to the land, or to fresh water. This affords a natural division into land and sea tortoises. In following out this division, we shall treat of them in two sections, including under the first those that frequent fresh waters.

SECT. I. Land and Fresh-water Tortoises.

I. TESTUDO GRÆCA. Lin. Common Land Tortoise.

Specif. Char.—The shell is hemispherical, and of a black and yellow colour, and having a bunch behind ; the pieces of which the disk is composed are convex, and the sides are obtuse.

Description. The length of the common tortoise is about six inches, and rarely exceeds eight : when full grown, it is about forty-eight ounces weight. The shell is composed of thirteen middle pieces, and about twenty-five marginal ones ; is of an oval form, and very convex above. The

middle pieces, or those which constitute the disk of the shield, are mostly of a square form, somewhat oblong ; their colour is blackish or dark brown, each having a broad yellow band running along one side, which is continued half way along the upper part. The colours vary in different individuals, and the shape of the pieces is also subject to occasional variations. The sulci or furrows which appear on the surface of young animals are obliterated as they grow old. The belly part of the shell is of a pale yellow colour ; the head is rather small, the upper part covered with irregular tough scales, and the neck with smaller pieces, which admit of the motion of the head ; the eye is small and black, and the mouth does not extend beyond the eyes. The legs are short ; and the feet, which are moderately broad, are covered with strong ovate scales. The feet have usually four stout claws, but their number is found to vary in different circumstances. The tail is rather shorter than the legs, is covered with small scales, and terminates in a naked, horny, pointed tip.

The land tortoise is a native of almost all the countries round the Mediterranean ; but it has been supposed to be more frequent in Greece, from whence it has derived its specific name. It is also found in the islands of the Archipelago, in Corsica, Sardinia, and in many parts of Africa. From the account of the Danish naturalist Forskal, it is employed in Greece for the purpose of food. "The inhabitants," he says, "often swallow the blood recent, and eat the eggs boiled, which are about the size of those of a pigeon, four or five in number, and of a white colour. In September the animal hides itself under ground, and again emerges in February ; laying its eggs in June, in a small hole, which it scratches in some sunny spot, out of which, after the first rains of September, the young are hatched, which are about the size of a walnut. The males of this species are said to fight often, butting at each other with such force, as to be heard at a considerable distance."

The land tortoise, when it is kept in gardens in Italy and Germany, is commonly observed to conceal itself in October, and to reappear in April. The period of retirement in England is about the end of October, and the time of its appearance is about the middle of April ; but it ought to be added, that these periods vary in different countries, and according to the temperature of the season.

The land tortoise lives to a very great age. In several instances which seem to be well authenticated, it has considerably exceeded the extraordinary period of an hundred years. One instance which is perhaps not the least remarkable, is recorded of a tortoise which was introduced into the archbishop's garden at Lambeth,

Great age.

Tortoises. beth, about the year 1633, and lived till the year 1753; the shell of which is still preserved in the library of the palace at Lambeth. Another remarkable circumstance respecting this individual is, that it was of a larger size than usual. The shell measured 10 inches in length, and six and a half in breadth.

Very tenacious of life. None of this order of animals is more tenacious of life than the tortoise. The experiments of Redi afford a remarkable proof of this fact. In the beginning of November he made a large opening in the skull of a land tortoise, extracted the whole of the brain, washed out the cavity, that no part might remain; and having left the hole open, let the animal go. It walked off seemingly uninjured, excepting that it closed its eyes, which never afterwards opened. At the end of three days, during which time the whole of the skull began to close, the wound was covered with a complete skin; and thus without brain it walked about as usual, and lived for six months. The same naturalist cut off the head of another tortoise, which lived for the space of twenty-three days afterwards.

Abstinence. This animal is not less remarkable for its abstinence. Blasius kept an individual of this species for ten months, during which time it tasted no kind of food whatever. It died about the end of that time, but this was ascribed to the severity of the season, rather than to the want of food; for the intestines being examined, they were found full of excrement of the natural colour.

Mr White, in his Natural History of Selborne, has given so full and distinct an account of the natural history of the land tortoise, founded on facts drawn from his own observation, that we shall lay it before our readers in his own words.

White's account of one. "A land tortoise (says he), which has been kept for thirty years in a little walled court belonging to the house where I now am visiting, retires under ground about the middle of November, and comes forth again about the middle of April. When it first appears in the spring it discovers very little inclination towards food; but in the height of summer grows voracious; and then as the summer declines, its appetite declines; so that for the last six weeks in autumn, it hardly eats at all. Milky plants, such as lettuces, dandelions, sow-thistles, are its favourite dish. In a neighbouring village one was kept, till by tradition it was supposed to be an hundred years old. An instance of vast longevity in such a poor reptile!

"On the 1st of November, I remarked that it began first to dig the ground in order to the forming its hybernaculum, which it had fixed on just beside a great tuft of hepaticas. It scrapes out the ground with its fore-feet, and throws it up over its back with its hind; but the motion of its legs is ridiculously slow, little exceeding the hour-hand of a clock; and suitable to the composition of an animal said to be a whole month in performing one feat of copulation. Nothing can be more assiduous than this creature night and day in scooping the earth, and forcing its great body into the cavity; but, as the noons of that season proved unusually warm and sunny, it was continually interrupted, and called forth by the heat in the middle of the day; and though I continued there till the thirteenth of November, yet the work remained unfinished. Harsher weather, and frosty mornings, would have quickened its

operations. No part of its behaviour ever struck me more than the extreme timidity it always expresses with regard to rain; for though it has a shell that would secure it against the wheel of a loaded cart, yet does it discover as much solicitude about rain as a lady dressed in all her best attire, shuffling away on the first sprinklings, and running its head up in a corner. If attended to, it becomes an excellent weather-glass; for as sure as it walks elate, and as it were on tiptoe, feeding with great earnestness in a morning, so sure will it rain before night. It is totally a diurnal animal, and never pretends to stir after it becomes dark. The tortoise, like other reptiles, has an arbitrary stomach as well as lungs; and can refrain from eating as well as breathing for a great part of the year. When first awakened it eats nothing; nor again in the autumn before it retires: through the height of the summer it feeds voraciously, devouring all the food that comes in its way. I was much taken with its sagacity in discerning those that do it kind offices: for, as soon as the good old lady comes in sight who has waited on it for more than thirty years, it hobbles towards its benefactress with awkward alacrity; but remains inattentive to strangers. Thus not only "*the ox knoweth his owner, and the ass his master's crib,*" but the most abject reptile, and torpid of beings, distinguishes the hand that feeds it, and is touched with the feelings of gratitude!

"The old Suffex tortoise, (he adds), that I have mentioned so often, is become my property. I dug it out of its winter dormitory in March last, when it was enough awakened to express its resentments by hissing; and, packing it in a box with earth, carried it eighty miles in post-chaises. The rattle and hurry of the journey so perfectly roused it, that, when I turned it out on a border, it walked twice down to the bottom of my garden; however, in the evening, the weather being cold, it buried itself in the loose mould, and continued still concealed."

"As it will be under my eye, I shall now have an opportunity of enlarging my observations on its mode of life and propensities; and perceive already that, towards the time of coming forth, it opens a breathing place in the ground near its head, requiring, I conclude, a freer respiration as it becomes more alive. This creature not only goes under the earth from the middle of November to the middle of April, but sleeps great part of the summer; for it goes to bed in the longest days at four in the afternoon, and often does not stir in the morning till late. Besides, it retires to rest for every shower; and does not move at all in wet days."

"When one reflects on the state of this strange being, it is a matter of wonder to find that Providence should bestow such a profusion of days, such a seeming waste of longevity, on a reptile that appears to relish it so little as to squander more than two thirds of its existence in a joyless stupor, and be lost to all sensation for months together in the profoundest of slumbers."

"While I was writing, a moist and warm afternoon, with the thermometer at 50, brought forth troops of shell-snails; and, at the same juncture, the tortoise heaved up the mould, and put out its head; and the next morning came forth, as it were raised from the dead, and walked about till four in the afternoon. This was a curious coincidence! a very amusing occurrence! to see

Tortoises.

Ibid. p. 148.

Tortoises, see such a similarity of feeling between the two *Φερίκοι*! for so the Greeks called both the shell-snail and the tortoise.
Ibid. p. 261.

“Because we call this creature an abject reptile, we are too apt to undervalue his abilities, and depreciate his powers of instinct. Yet he is, as Mr Pope says of his lord,

———“Much too wise to walk into a well:”

and has so much discernment as not to fall down a haha; but to stop and withdraw from the brink with the readiest precaution.

“Though he loves warm weather, he avoids the hot sun; because his thick shell, when once heated, would, as the poet says of solid armour, “scald with safety.” He therefore spends the more sultry hours under the umbrella of a large cabbage-leaf, or amidst the waving forests of an asparagus-bed.”

“But as he avoids heat in the summer, so, in the decline of the year, he improves the faint autumnal beams, by getting within the reflection of a fruit-wall: and, though he never has read that planes inclining to the horizon receive a greater share of warmth, he inclines his shell, by tilting it against the wall, to collect and admit every feeble ray.

“Pitiable seems the condition of this poor embarrassed reptile: to be cased in a suit of ponderous armour, which he cannot lay aside; to be imprisoned, as it were, within his own shell, must preclude, we should suppose, all activity and disposition for enterprise. Yet there is a season of the year (usually the beginning of June) when his exertions are remarkable. He then walks on tiptoe, and is stirring by five in the morning; and, traversing the garden, examines every wicket and interstice in the fences, through which he will escape if possible: and often has eluded the care of the gardener, and wandered to some distant field. The motives that impel him to undertake these rambles seem to be of the amorous kind: his fancy then becomes intent on sexual attachments, which transport him beyond his usual gravity, and induce him to forget for a time his ordinary solemn deportment.”

2. TESTUDO MARGINATA, *Marginated Tortoise.*

Specif. Char.—The shell is blackish-brown, variegated with yellow, oblong, and gibbose, widened and depressed on the hind part.

The length of this species is nearly fourteen inches, the breadth about ten, measuring the curvature of the shell. The head which is flat and triangular above, is nearly two inches long, above an inch broad, and one inch deep. The eyes are furnished with a nictitating membrane; but the lower eyelid only is moveable. The mandibles are strong, notched, and internally beset with protuberances which have been sometimes mistaken for teeth. The external orifices of the ears are covered with the common skin. The tail is very short. The fore legs are about three inches and a half long; the hind legs are about two and a half long. The skin is grainy, and covered with brown coloured, unequal, hard scales, extending over the head, legs, and tail. Some of these scales on the ends of the feet are large, hard, and pointed; so that at first sight they might be taken for claws. The feet are thick, and so cover-

ed with the investing membrane, that the toes are only distinguished.

The disk of the shell is composed of thirteen pieces which are striated on the margin. The border consists of twenty-four pieces; all of which, especially the posterior ones, are proportionally larger than in the other species. From the position of the latter, the circumference of the upper shell appears toothed. The upper shell is very convex, being more than four inches deep: in consequence of this form, when the animal is placed on its back, it can recover its former situation.

The colour of this species is generally dark, or blackish-bay. The convex part of the pieces which compose the disk are irregularly varied with yellow. The pieces are also variegated with the same colour. This prevails chiefly on the posterior divisions, and these are distinctly striated or furrowed. The width or dilatation of these divisions, being greater than in other species, constitutes the principal characteristic mark of the present. The colour of the under shell is pale yellow; each division is marked on its upper joining with a transverse blackish band, which runs into a pair of pointed or triangular processes, extending nearly to the inferior division. Another specific difference between this and the common tortoise is, that in the former the outline of the shell, seen from above, is proportionally longer, and has a slight sinking or contraction on each side.

It is supposed that this species is a native of America, but this seems not to be certainly determined; and little, or scarcely any thing, is known of its natural history.

3. TESTUDO GEOMETRICA, *Geometrical Tortoise.*

Specif. Char.—The shell is black and ovate; the scutella elevated, and radiated with yellow.

The number of pieces of which the disk is composed, is subject to variation. Instead of thirteen, fourteen pieces have been observed in different specimens. These pieces are very prominent, striated distinctly with numerous lines on their sides, and terminated above by a yellowish coloured, flat, hexagonal roughened space, from which proceed, in a radiated direction, some well defined yellow streaks towards the edge; in this forming on the black ground colour, something like geometrical figures. The marginal pieces are commonly 24, but sometimes 26. They also are streaked with yellow. As in other species, the brightness of the colours is subject to variation, but their regular distribution is never entirely obliterated.

This species, it is said, is a native of Asia, Africa, and also of America; but this seems not to be fully ascertained, which is rather surprising, as its shell is oftener met with in Europe than that of any other species. Thunberg says that it is a native of the Cape of Good Hope, where it frequents shrubby places. It is said also, that it is found on the coast of the Pine islands, between the continent of America and Cuba, where they frequent moist and marshy places in the forests. They are very easily taken, and are sought after as food. It is usual for the natives to put a mark on the shield, and then to allow them to go about in the woods, finding them again almost as readily as any domesticated animal, when they transport them to Cuba. This species

Tortoises. cies is supposed to be the *terrapin* of Dampier, who gives the above account, and represents it as beautifully variegated.

4. TESTUDO RADIATA, *Radiated Tortoise*.

Specif. Char.—Shell ovate, black; scutella flattish, and radiated with yellow.

This species has sometimes been confounded with the preceding; it often however exceeds a foot in length, and its outline is nearly smooth. The size of the geometrical tortoise is less, its outline is very much tuberculated, and the pieces of which it is composed rise greatly towards their centres.

According to Grew, it is a native of Madagascar; and its characters correspond nearly with one described by Browne in his history of Jamaica, so that it must also be considered as a native of that island. Grew has given a very particular description of it.

5. TESTUDO INDICA, *Indian Tortoise*.

Specif. Char.—Shell brown, reflected above the neck; the three upper scutella are marked with a tubercle.

This is a very large species, which was first described by Perrault in the history of animals published by the Royal Academy of France. It measured from the tip of the nose to the tail four feet and a half; the height or convexity was about fourteen inches; the shell itself was in length three feet, and two in breadth; the colour was of a dull brown. The pieces composing the shield were large and dissimilar, of which the three anterior were marked in the middle with a round knob or tubercle, about half an inch wide. The skin of the head, feet, and neck, was wrinkled and granulated; the fore legs were nine inches long, the feet undivided, with five blunt claws: the hind legs were eleven inches long, with four toes, each armed with a claw; the tail six inches thick at the base, fourteen inches in length, and terminating in a horny bent process. This species is a native of the coast of Coromandel.

Var. 1. A variety of this species brought from the Cape of Good Hope, is described by Vossmaer: it was about $2\frac{1}{2}$ feet long, $1\frac{1}{2}$ foot broad, one foot high, with thirteen pieces in the disk, and twenty-five in the margin. In this, the three tubercles on the anterior pieces of the shield are wanting.

Var. 2. Another variety of this species, of a very large size, has been brought from the South Sea islands. The shell, which is of a dull uniform brown, with a smooth surface, is of an ovate, oblong form, widening at the bottom, and contracting considerably on each side of the neck. It is at least three feet and a half long; the divisions are all even, but the whole surface of the shell is marked with regular elevations and depressions.

TESTUDO RUGOSA, *Wrinkled Tortoise*.

Specif. Char.—Shell black, wrinkled, mottled and variegated with yellow; the middle dorsal piece subpan-duriform.

This species, of which a specimen is preserved in the
VOL. VIII. Part I.

Leverian museum, is described by Dr Shaw†. The colour is dark brown, or black, thickly mottled with small confluent spots of pale yellow, which are largest on the sides of the shell. The form of the shell is long and oval, dilated or widened behind; the depth or convexity is very considerable. The three middle divisions of the row of scutella on the back are somewhat panduriform, or fiddle-shaped. The upper piece resembles the outline of a pitcher; the lowest approaches to a hexagonal form. The number of the side pieces is four, of the usual form; that of the marginal pieces is twenty-five, the upper one very small. A carina or ridge runs down the dorsal row; the upper surface of the shell is strongly wrinkled. The under shell is smooth, and of a yellowish white colour, mottled with black. The length of the shell is nine and a half inches; width in the middle five inches. Its native country is unknown.

Var. A variety of this species is also described, consisting chiefly in the colours of the shell, and owing, it is supposed, to a sexual difference.

7. TESTUDO EUROPEA, *Speckled Tortoise*.

Specif. Char.—Shell oval, flattish, smooth, dark-brown, marked with numerous yellowish specks and streaks. *Testudo orbicularis*, Lin.

This species is from four to five inches long; the colour is blackish or olive brown; the shell flattish, but slightly convex, marked with numerous, oblong, yellow specks, disposed in a radiated form on each division of the shell. The skin of the neck and breast is similarly spotted. The disk consists of thirteen, and the margin of twenty-five pieces. The under shell is of a whitish yellow, tinged with brown at the joints. The head is ovate, somewhat convex above, flattish on the sides and beneath. The skin of the neck is wrinkled and loose. The legs are short, and covered with scales. The feet are webbed, the fore feet having five toes, the hind only four. The claws are sharp pointed and crooked; the tail is nearly half the length of the body, and is thin and compressed.

This species is a native of Italy, Sardinia, France, Hungary, and Prussia, as well as other parts of Europe. It inhabits lakes and muddy waters, feeding on small fish, insects, snails, and aquatic plants. The flesh is esteemed and employed as food, and in some places brought to market for sale. It is sometimes kept in ponds for the purpose, and fed with lettuce leaves, bread, &c. It may be kept in a cellar, and fed with oats scattered on the floor, which it eats as soon as they begin to germinate. In the beginning of spring it deposits its eggs in sandy places, exposed to the sun; and it has been said, that these are not hatched till the spring following. The growth of this animal is extremely slow, and it varies somewhat in colour, according to the climate where it is found.

8. TESTUDO LUTARIA, *Mud Tortoise*.

Specif. Char.—The shell is flattish, and the tail is half the length of the body.

The length of this species does not exceed seven or eight inches from the tip of the nose to the end of the tail. The breadth is about three or four inches. The disk is composed of 13 pieces, which are striated and slight-

Tortoises. ly punctated in the centre. A longitudinal ridge runs along the middle range. The margin consists of 23 pieces slightly striated on the edges. The shell is blackish, as well as the skin; the feet are webbed, and have five toes before and four behind.

This species is a native of many parts of Europe; it is also found in different parts of Asia, as in India and Japan. It is very common in France, particularly in Languedoc, and in different parts of Provence. It is said that such numbers were found one time in a lake half a league wide, in the plain of Durance, that the neighbouring peasantry were supported by them for more than three months.

This species always lays its eggs on land, digging a hollow in the ground, and covering the eggs with earth. When the young are first hatched, they are only about half an inch in diameter. The motions of this species are quicker than those of the land tortoise. It continues to grow for a long time, and lives for upwards of 24 years. It has been found useful in gardens, by destroying small snails, and other animals which are destructive to vegetables; but it ought to be observed, that it is disposed to attack and destroy the fish in fish-ponds.

9. TESTUDO CARINATA, *Carinated Tortoise.*

Specif. Char.—Feet digitated; shell gibbose; four first dorsal scutella carinated; sternum entire.

The shell of this species does not exceed three inches in length. The form is broad, and somewhat orbicular; the colour is brown, and each scutellum is marked with a pale zone of confluent spots, which surround the centre part, the edges of each being surrounded with three or four distinctly marked furrows. Marginal pieces 25 in number, including the uppermost, which is very small. Its native country is unknown.

10. TESTUDO CAROLINA Linn. TESTUDO CLAUSA Shaw. *Close Tortoise.*

Specif. Char.—Shell blackish, irregularly spotted with yellow; dorsal carina obtuse; under shell bivalve, completely inclosing the upper shell.

This species is thus described by Edwards. “The head is furnished with a hard or shelly covering of a dark brown colour on the top: on the sides and throat it is yellow, with small black or dusky spots: its nostrils are near together, a little above the end of the beak: the eyes are of a yellowish colour: the neck is covered with a loose skin of a dark purplish flesh colour, which partly covers the head when it is not fully extended: the hinder legs and parts about the vent are covered with a skin of the same dull flesh colour as the neck: the fore-legs and feet are covered with yellow hard scales: it hath five toes on each foot forwards, and four on each of the hinder feet, all armed with pretty strong claws: the shell above rises pretty much, and is round, divided into separate scales of the horny substance called tortoise shell: each scale is engraven, as it were, with rings round its extremities, which lessen inwards to its centre: the shell above is of a dusky brown colour, with yellowish spots of various forms: underneath it is flattish, and of a yellow colour, with

black clouds and spots: it has only the rudiment of a tail, on which the vent is placed: the lower shell is divided across the middle of the belly, and joined to the upper shell by a tough though flexible skin, by which means it can, when it draws in its head and legs, close up its shell as firmly as an oyster.” From this peculiarity in its structure, this species has derived its name; and this proves so strong a defence to the little animal, that it seems not only not to receive any injury, from having a weight of five or six hundred pounds laid upon it, but to walk under the load without any inconvenience.

The length of this species seldom exceeds four or five inches. It is a native of North America, and is chiefly found in marshy situations; but it also sometimes appears in dry and warm places. It lives both on vegetables and animals. Of the latter beetles, mice, and sometimes serpents, are its prey. These it seizes, draws them into its shell, and crushes them to death. It is much in request on account of its eggs, which are esteemed a great delicacy. They are about the size of a pigeon's egg.

11. TESTUDO SULCATA, *Sulcated Tortoise.*

Specif. Char.—Shell brown, ovate; scutella furrowed, and yellow on each side.

This species exceeds a foot in length, from the tip of the nose to the end of the tail; so that it is one of the larger of the land tortoises. The shell is very convex. The disk is composed of 13 pieces, which are five and six-sided; and each is transversely and strongly furrowed from the lower edge to the upper area; across these run three impressed lines in an opposite direction: the marginal pieces are furrowed in the same manner. The colour of the shell is in general a dull yellow; but both the shield and marginal pieces have a brown and yellow division. The head is large and covered with six-sided scales of different sizes. The fore and hind legs are also scaly; on the former are five claws, on the latter only four. The tail is very short.

This species is a native of the West Indies; and it is supposed to be the same with the *hicatee* described by Browne in his History of Jamaica.

12. TESTUDO TABULATA, *Tabular Tortoise.*

Specif. Char.—Shell brown, oblong, gibbous; scutella of the disc rectangular and furrowed, having yellowish coloured centres.

The shape and size of the pieces of which the disc is composed, are more uniform than in any other belonging to this genus. This seems to be the principal mark of discrimination. Each piece is slightly convex, and in general six-sided, excepting some of the pieces towards the sides, which are five-sided. The central part of each piece is large, and slightly granulated, and the sides are distinctly sulcated. The whole has a kind of flattened or tabular appearance: the colour is a yellowish chestnut; it is paler on the centre of each division; the legs are thick, and spotted with red; the number of pieces on the disc is 13, that of the margin 23. The length of the shell is from five to six inches. It is supposed to be a native of Africa but according to some, it has been found in Brazil.

Tortoises. 13. TESTUDO CONCENTRICA; *Testudo Palustris* Lin.
Concentric Tortoise.

Specif. Char.—Shell somewhat depressed, slightly ridged, oval, of a yellow colour; having the scutella marked with brown concentric zones.

The shell of this species is flatter than that of others; in some of the larger specimens nearly smooth: the middle row of pieces, of which the disc is composed, are five in number; they are more elevated than those of the sides, are six-sided, and project behind into an obtuse carina. There are four side-pieces on each side, which are pentagonal. The ground colour of the whole is pale, and marked with brown zones and centres. The shell is from four to six inches long.

This tortoise is a native of North America, and is met with in the markets at Philadelphia, where it is sold under the name of *terrapin*. It is also a native of Jamaica, where it is very common. It is said, by Brown, who seems first to have described it, to be a wholesome and delicate food. In that island, it grows to the length of eight or nine inches.

14. TESTUDO PICTA, *Painted Tortoise*.

Specif. Char.—The shell is oblong, and slightly convex, smooth, and of a brown colour; the scutella are bordered with yellow.

This species is well distinguished from all others, by the remarkable colours of the shield, which consists of 13 segments nearly square, and deeply edged with pale yellow. The marginal pieces are 25 in number. The shell is from four to six inches long.

The painted tortoise frequents fresh waters, and in particular, is found in the slow and deep rivers of North America. In bright sunshine weather they leave the water in great numbers, and bask themselves on stones, pieces of wood, and the banks of the streams, suddenly retreating into the water, when they are disturbed. They walk very slowly, but swim with great rapidity. They can remain for many hours together under the water, but live only a few days in the open air. They are extremely voracious, and are known to destroy young aquatic fowls, seizing them by the feet, and dragging them under water. Sometimes they are employed for the purpose of food.

15. TESTUDO GUTTATA, *Spotted Tortoise*.

Specif. Char.—Shell oblong, slightly convex, smooth, and of a brown colour, with scattered yellow spots.

This species is also sufficiently distinguished by its remarkable colour. The pieces both of the disc and margin being marked with a few distantly placed round yellow spots. These spots vary, as well as the ground, in different individuals. The young of this species, which itself is small, are not larger than a pigeon's egg, are very black, and beautifully spotted with gold colour.

This tortoise is a native of North America, frequenting lakes and rivers.

16. TESTUDO ELEGANS, *Elegant Tortoise*.

Specif. Char.—The shell is round, convex, and of a yellow colour, with transverse, oval, brown spots.

This is a very small species, only about two inches long; the shell is of a bright yellow colour, the surface apparently smooth. At each of the joinings which compose the disc, there is a large, leaf-shaped, dark brown transverse spot. The marginal pieces are marked with a transverse black zone; the head is short and thick.

Nothing particular is known of its natural history, or to what country it belongs.

17. TESTUDO AREOLATA, *Areolated Tortoise*.

Specif. Char.—The shell is slightly convex; the scutella are nearly four-sided, elevated, deeply furrowed, and are furnished with depressed rough areolæ.

The length of this species is from three to four inches. The scutella, which are nearly four-sided, are broader than long, with a pretty large, depressed, central part, which is of a yellow colour, roughish, and surrounded by a pale zone. The margin is composed of 25 pieces; the disc, in some individuals, of 15, and in others of 14.

This tortoise, according to some, is a native of Brazil, according to others, of the East Indies.

18. TESTUDO SERRATA, *Serrated Tortoise*. *Testudo Spengleri*, Lin.

Specif. Char.—Shell depressed, of a yellow colour, and minutely freckled with dusky specks. The scutella of the disc are all ridged; the hinder margin of the shell serrated.

This tortoise is considered and described by Dr Shaw as a new species; it is small, only about three quarters of an inch long, and about two inches and a half broad. It is of an oval form, and slightly convex. The colour is of a yellowish brown, and when closely examined, appears thickly marked with minute, confluent, dusky spots. The under shell is blackish, with a yellow margin.

The native country of this species is unknown.

19. TESTUDO PUSILLA, *Little Tortoise*. *African Land Tortoise* of Edwards.

Specif. Char.—Shell hemispherical, with convex, trapezoidal scutella, striated on the margin, and dotted on the disc. Feet subdigitated.

The shell of this species measures only about four inches in length. The whole animal, from the tip of the nose to the end of the tail, does not exceed six. This species has a considerable resemblance to the common tortoise, or *testudo græca*. It is particularly described by Edwards, who kept two of them which he received from West Barbary for two years in the garden of the college of physicians in London; but of its natural history, nothing farther is known.

20. TESTUDO TRICARINATA, *Tricarinated Tortoise*.

Specif. Char.—Shell oval, slightly convex; margin entire; all the scutella of the disc carinated.

This species resembles a good deal the *testudo orbicularis*, Lin. In size it scarcely exceeds that of a large walnut; the colour is blackish; the shell is composed

Tortoises. of 13 scutella; the number of the marginal pieces is 23. Each scutella is marked in the middle with a longitudinal ridge, and wrinkled on the sides with several furrows and roughish points.

Its native place, and its natural history, are unknown.

21. TESTUDO SCABRA, *Rough Tortoise*.

Specif. Char.—Shell flattish, the intermediate scutella elevated on the back; feet palmated.

This tortoise is about two inches and a half in length, and nearly two in breadth. Its form is somewhat cordated, of a light reddish colour, finely variegated on the head and shell, with wavy white lines and spots. The feet, each of which is furnished with five toes, with sharp claws, are marked with red spots. The head is prominent, and the eyes are small.

It is considered by some naturalists as a native of Amboyna.

22. TESTUDO SCRIPTA, *Letter'd Tortoise*. *Testudo Scabra* of Thunberg.

Specif. Char.—Shell depressed, orbicular; scutella marked with various figured characters; marginal pieces spotted underneath.

This species is either very small, or the specimen from which the descriptions have been taken were very young, as it did not exceed the size of a half-crown piece. It is flattish, of a round form, and whitish colour tinged with yellow. The upper surface is marked with various figures, having somewhat the appearance of written characters. The pieces of the margin, which are 25 in number, are marked with similar characters as those of the scutella. The feet are large, webbed, and have five toes furnished with sharp claws.

It is not mentioned to what country it belongs.

23. TESTUDO GALEATA, *Galeated Tortoise*.

Specif. Char.—Shell depressed, oval; the three middle scutella sharply ridged; marginal pieces 24.

This is a small species, not exceeding two inches and a half long, and about two broad. The colour of the shell is pale brown, and the disc is composed of 13 scutella, of which the middle row is very broad, and strongly ridged in the middle. Marginal pieces 24 in number, and similar in colour to the disc, but having white edges. The head is smooth, furnished with a kind of shield, from whence it derives its specific name.

Its native place is unknown; but an individual of this species, brought from India, lived two years. It was kept in fresh water, and could occasionally remain for a few hours in the open air. Its food was bread and flies. It continued in a kind of dormant state during the winter, taking no food from the beginning of October till the middle of May, and scarcely ever raising its head above the surface of the water.

24. TESTUDO DENTICULATA, *Denticulated Tortoise*.

Specif. Char.—Shell roundish, and heart-shaped; marginal segments denticulated; feet subdigitated.

This species is about four inches long and three broad. The shell is of a pale yellowish brown colour; the disc is composed of broad five and six sided scutella. They are flattish, and have a large distinct space in the middle, granulated with small tubercles. The other part of the scutellum is marked with five furrows; the marginal pieces are 23 in number, and project in a ferrated form.

It is supposed to be a native of North America.

25. TESTUDO PENNSYLVANICA, *Pennsylvanian Tortoise*. *Small Mud Tortoise* of Edwards.

Specif. Char.—Shell brown, smooth, elliptic; back flattish; the middle row of scutella somewhat rhomboidal and imbricated. The first is subtriangular.

This is a small tortoise; the length of the shell, at its full growth, does not exceed three or four inches. In this species, the middle row of dorsal pieces are longer than in others, and are so arranged as to overlap each other at the tips. The marginal pieces are 23 in number, the upper one being very small. The edges of the shell are tinged with dull yellow. In the joinings of the pieces, this species resembles the structure of the close tortoise, so that the animal has the power of concealing itself almost entirely, by closing up its shell.

It is a native of North America, and is particularly found in Pennsylvania, where it frequents muddy waters, and hence its trivial name of mud tortoise. When alive, it is said that it gives out a strong musk smell.

Several varieties of this species have been noticed by naturalists.

26. TESTUDO LONGICOLLIS, *Long-necked Tortoise*.

Specif. Char.—Smooth, ovate; neck very long.

This species is about five inches and a half long, and four and a half broad. The shell is of an oval form, of a dark olive brown colour, resembling in some parts of it the grain of common black leather. The disc is composed of 13, and the margin of 25 pieces. The under shell is of a yellowish colour, marked with black brown at the joinings. The claws on the feet, which are four in number, are like those of birds.

It is a native of New Holland.

27. TESTUDO CASPICA, *Caspian Tortoise*.

Specif. Char.—Shell orbicular, head scaly, tail naked; five claws on the fore feet, four on the hind.

This species of tortoise grows to such a size, that several men can stand together on its shell. The pieces of which the disc is composed are nearly four-sided, and square: those of the margin are in the form of a parallelogram. The colour is variegated with black and green; the under shell is blackish, spotted with white.

It is a native of Hyrcania, and frequents fresh waters.

28. TESTUDO FEROX, *Fierce Tortoise*.

Specif. Char.—Shell ovate, cartilaginous; three claws on the feet, which are tubular; nostrils prominent.

This

Tortoises.

This species is about one foot and a half in length, and about 15 inches in breadth. The shield, which is hard or ossous in the middle only, while the edges become gradually flexible and coriaceous, is a sufficiently characteristic mark of distinction. The head is small, and somewhat trigonal, with the snout much elongated. The colour of this species is brownish; olive above; and on the under parts white.

This species is a native of Pennsylvania, Carolina, and other parts of America. It is extremely vigorous and swift in its motions, and when it is disturbed or attacked, it springs forward towards its enemy with great fierceness. Some which have been found in the rivers and lakes of East Florida, weighed from 30 to 40 lbs.; and it is said that they even grow to such a size as to weigh 70 lbs.

A species described by Thunberg, under the name of *testudo rostrata*, is supposed by Dr Shaw to be an individual belonging to the above, not yet arrived at its full growth. The *testudo triunguis* of Forskal seems also to be a variety of this species.

29. TESTUDO GRANULATA, *Shagreened Tortoise*.

Specif. Char.—Shell granulated, orbicular, flattish; border cartilaginous.

The shield of this species measures about $3\frac{1}{4}$ inches in length, and $3\frac{1}{2}$ in breadth. It appears as if it were composed of two shields, the upper of which is the smallest and shortest. This is of a bony substance, roughened all over like the surface of shagreen. It is composed of 23 pieces, eight of which are placed on each side. The borders of this shield are cartilaginous and somewhat transparent, through which may be seen the ribs of the animal.

This species is said to be a native of India; but of its habits and natural history nothing is known.

30. TESTUDO FIMBRIATA, *Fimbriated Tortoise*.

Specif. Char.—Shell oval, a little convex, and having a triple ridge; neck fimbriated on each side; snout cylindrical, and feet subdigitated.

The length of the shell of this species is above 15 inches, and the breadth 11. The length of the animal, from the tip of the nose to the end of the tail, is two feet three inches. The head is large and flat, edged on the sides with wrinkled membranaceous appendages, and covered behind with a three-lobed prominence. The nose is cylindrical, and somewhat resembles a proboscis. It is 10 lines long, truncated, and pierced at the tip by the nostrils. The disk of the shell is a little convex, and composed of 13 semicircular pieces, which are nearly conical. They are all wrinkled, and irregularly notched at the hinder part. The marginal pieces are 25 in number, nearly square, radiated on the surface with oblique wrinkles, and toothed on the inner edge. The colour is brown, and somewhat paler beneath.

This species is said to be a native of Guiana, and was once common in the rivers of Cayenne; but it is now rarely to be met with, having been much sought after as a nourishing food. Its food is aquatic plants; and it is said that it leaves the river, and wanders about in the night, to some distance from the banks, in search of

pasture. The individual from which the description is taken by M. Bruguiere, was brought to him alive, and lived for some time on herbs, bread, and some other substances. It laid several eggs, one of which produced a young tortoise in the box where it was kept.

Turtles.

31. TESTUDO SERPENTINA, *Snake Tortoise*.

Specif. Char.—Shell ovate, depressed, triply carinated, and sharp scaled; rounded and acutely ferrated at the posterior margin.

This species grows to the weight of 15 or 20 lbs. The general colour is of a dull chestnut brown, but lighter or paler underneath. The head is large, triangular, and covered with a warty skin. The neck is also covered with scaly warts. The toes, which are five in number on the fore feet, and four on the hind feet, are all distinct, but connected by means of a web. They are armed with long claws. The tail is straight, two-thirds the length of the shell, compressed, and crested on the upper part with sharp bony scales, pointed backwards.

This species is a native of North America; inhabiting stagnant waters, where it preys on fish, ducklings, &c. seizing its prey with great force. And indeed, whatever it seizes with its mouth, it holds with such force, that it will suffer itself to be raised out of the water rather than quit its hold. The more easily to catch its prey, it is said too, that it conceals itself in muddy waters, leaving out only part of its back, which has the appearance of a stone.

32. TESTUDO SQUAMATA, *Scaly Tortoise*.

Specif. Char.—Body ovate, smooth beneath; but the upper part with the neck, feet, and tail, covered with numerous scales.

The head of this species is small, resembling that of a snake; the eyes are small and moveable, the teeth sharp. All the upper part of the body is covered with scales; the under parts are soft, smooth, and tender; the tail is pretty long.

It is said to be a native of China and Java. The flesh is accounted a great delicacy, and the scales, pulverised and dissolved in water, are given by the Chinese as a remedy in cases of dysentery and colic.

SECT. II. *Turtles, or Sea Tortoises.*

THE large and long fin-shaped feet, which inclose the bones of the toes, are the most obvious characteristic marks of distinction between the sea tortoises, and the species included under the preceding section. In the sea tortoises the shield is also composed of a strong bony covering, which is coated externally with hard horny plates, which in some of the species are much thicker and stronger than those of the land tortoises.

33. TESTUDO CORIACEA, *Coriaceous Turtle*.

Specif. Char.—Colour brown, paler beneath; shell coriaceous, marked with five longitudinal, tuberculated ribs.

This species, in the form of its body, which is proportionally longer, and in its outer covering, which is not

Turtles. not of a horny substance, but resembles strong leather, is sufficiently distinguished from others. Five distinct, prominent, tuberculated ridges run along the whole length of this covering. This species is not furnished with an under or thoracic shell. The head is large, and the upper mandible is notched at the tip, which gives it the appearance of having two large teeth. The fins are large and long, and covered with a tough leathery skin. The general colour is dusky brown, but paler beneath.

The coriaceous turtle is a native of the European seas. It is also found on the coasts of South America and Africa. It frequents the Mediterranean sea, and has been occasionally met with on the coasts of France and England. This species, of all the turtles, grows to the largest size. Some have been taken eight feet in length, and weighing no less than 1000 lbs. One was taken in the month of August 1729, not far from the mouth of the Loire in France, which measured seven feet one inch in length, three feet seven inches in breadth, and two in thickness. It is reported that it uttered so hideous a noise when it was taken, that it might be heard at the distance of a quarter of a league. At the same time it foamed at the mouth, seemingly with rage, from which it emitted a noisome vapour. Another was taken in 1778, on the coast of Languedoc, which measured seven feet five inches in length. One taken on the coast of Cornwall in July 1756, measured, from the tip of the nose to the end of the shell, six feet nine inches, and the weight was supposed to be near 800 lbs.

The Greeks, it is supposed, were acquainted with this species of turtle, which they employed in the construction of the ancient lyre or harp. The flesh of this species is extremely fat, but coarse and ill-flavoured; but the religious order of Carthusians prefer it to that of every other.

34. TESTUDO MYDAS, *Green Turtle.*

Specif. Char.—Of a brownish colour, with 13 scales on the disc.

This is the esculent, or common green turtle; the latter name being derived from the colour of the fat. This is supposed to be owing to the vegetable matters on which the animal feeds, and especially the *zosteria marina*, or turtle grass, of which it is said to be extremely fond. This species is one of the largest of the genus, often exceeding five feet in length, and weighing 500 or 600 lbs. The shell is somewhat heart-shaped, pointed at the extremity, and composed of 13 dorsal divisions, with 25 marginal pieces. The colour is of a dull pale brown, more or less variegated with deeper undulations, but less strong and beautiful colours, than the hawkbill turtle, which yields the tortoise shell.

The green turtle is a native of all the seas within the torrid zone.

This species of turtle has been long esteemed a delicious food by the inhabitants of many of the islands and continents within the torrid zone. In the time of

Sir Hans Sloane, the inhabitants of Port Royal in Jamaica employed 40 sloops for the purpose of catching them. The markets were at that time, as they are at present, supplied with turtle in the same way as those of Europe are with butcher's meat. Many of them, according to Catesby, are carried from the Bahama islands to Carolina, where they are esteemed as a great delicacy. "They feed," he adds, on a kind of grass, growing at the bottom of the sea, commonly called *turtle grass*. The inhabitants of the Bahama islands, by frequent practice, are very expert at catching turtles, especially the green turtle. In April they go in boats to Cuba, and other little neighbouring islands, where, in the evening, especially on moon-light nights, they watch the going and returning of the turtle, to and from their nests, at which time they turn them on their backs, where they leave them, and proceed on, turning all they meet, for they cannot get on their feet again when once turned. Some are so large, that it requires three men to turn one of them (A). The way

by which the turtle is most commonly taken at the Bahama islands, is by striking them with a small iron peg of two inches long, put in a socket at the end of a staff of 12 feet long. Two men usually set out for this work in a little light boat or canoe, one to row and gently steer the boat, while the other stands at the head of it with his striker. The turtle are sometimes discovered by their swimming with their head and back out of the water; but they are oftentimes found lying at the bottom, a fathom or more deep. If a turtle perceive he is discovered, he starts up to make his escape; the men in the boat pursuing him, endeavour to keep sight of him, which they often lose, and recover again, by the turtle putting his nose out of the water to breathe. Thus they pursue him, one paddling or rowing, while the other stands ready with his striker. It is sometimes half an hour before he is tired; then he sinks at once to the bottom, which gives them an opportunity of striking him, which is by piercing him with an iron peg, slipping out of the socket, but is fastened with a string to the pole. If he is spent and tired by being long pursued, he tamely submits when struck, to be taken into the boat, or hauled ashore. There are men who, by diving, will get on their backs, and by pressing down their hind parts, and raising the fore part of them by force, bring them to the top of the water, while another slips a noose about their necks".

"The turtle never go on shore, except to lay their eggs, which is in the month of April. They then crawl up from the sea above high-water mark, where they dig a hole two feet deep in the sand, into which in a single night they drop above 100 eggs. At this time they are so little liable to be disturbed, that they have been known to drop their eggs into a hat held by a person under them. If, however, they happen to be disturbed before they begin to lay, they forsake the place, and seek another. They lay their eggs at three, ^{Eggshatch-} and sometimes at four different times, a period of four-^{ed by the} teen days elapsing between each time. When they ^{(sun.} have laid their complement of eggs, they fill the hole with

(A) We have seen the same mode of watching and turning the turtle practised in Jamaica, and the phrase there is not to take or seize the turtle, but to *turn* it.

Turtles. with sand, and leave them to be hatched by the heat of the sun. This is usually accomplished in about three weeks". The eggs are round, white, covered with a smooth parchment-like skin, and about the size of tennis balls.

Although the green turtle be a native of the seas within the torrid zone, it is sometimes found on the coasts of Europe, where it has probably been driven by storms, or has fallen overboard from ships from the West Indies. A turtle of this kind, of the enormous size of six feet long, by four broad, and of the weight of 800 or 900 pounds, was taken at Dieppe in France in 1752; and two years afterwards, another still larger was taken on the same coast.

Introduced into Europe.

The flesh of the green turtle is not only highly esteemed in those countries of which it is a native, but also so much sought after in Europe, that the importation of it now forms a considerable article of trade, few ships returning from the West Indies without bringing some turtle. But the turtle which now forms a dish, by no means uncommon at the tables of the luxurious, seems to have been little known in Britain previous to the middle of the 18th century; and indeed it was so rare an occurrence, that when one was eaten, it was announced to the public as a piece of news. This appears from the following articles of intelligence. "Friday, August 31. a turtle weighing 350 pounds was eaten at the King's Arms tavern, Pallmall; the mouth of an oven was taken down to admit the part to be baked." *Gent. Mag.* for 1753. "Saturday, September 29. the Turtler, Capt. Crayton, lately arrived from the island of Ascension, has brought in several turtles of above 300 pounds weight, which have been sold at a very high price. It may be noted, that what is common in the West Indies, is luxury here." *Ibid.* 1753. "Saturday, July 13th, the Right honourable Lord Anson made a present to the gentlemen of White's chocolate house, of a turtle which weighed 300 pounds weight, and which laid five eggs since it was in their possession. Its shell was four feet three inches long, and about three feet wide. When its head was cut off, at least five gallons of blood issued from it, and so full was it of life, that the mouth opened and shut for an hour after it was cut off." *Ibid.* 1754.

35. TESTUDO CARETTA, Loggerhead Turtle.

Specif. Char.—Variegated with 15 dorsal scales, of which those of the middle row are gibbous toward the tip.

This species most resembles in general appearance the last species, or green turtle. The larger size of the head, the proportional breadth of the shell, the deeper and more variegated colours, are marks of distinction sufficiently characteristic; but the number of dorsal segments amounting to 15, affords the principal character; for not only the middle row, but those of the sides contain five pieces; and this number is almost always uniform and constant. There is a considerable protuberance on each of the pieces of the middle row, which constitutes a range of tubercles along the back of the shield; the fore feet are very large and long; the hind feet are broad, but much shorter.

This species frequents the same seas with the green turtle, but it is also found occasionally in very distant

latitudes, as in the Mediterranean, and particularly about the coasts of Italy and Sicily.

Turtles.

Excepting the coriaceous turtle, this species is the largest in size which has yet been discovered. In the Leverian museum, there is a skull which seems to belong to this species. It measures above a foot in length, and it is said that it was taken from a turtle, the weight of which exceeded 1600 pounds.

In a commercial point of view the loggerhead turtle is of little importance; for the flesh is coarse and rank, and the plates of the shell are too thin to be applied to the usual purposes of tortoise shell. It yields, however, a considerable quantity of oil, which is fit for burning in lamps.

This species is very strong and fierce; it can defend itself very vigorously with its legs, and with its mouth it is able to break the strongest shells and other substances. One which was exhibited at Bologna, in an instant bit in two a thick walking stick which was offered to it.

The following is the account of this species of turtle which is given by Catesby. "The loggerhead turtles, says he, are the boldest and most voracious of all others; their flesh is rank, and therefore little sought for, which occasions them to be more numerous than any other kind. They range the ocean over; an instance of which, among many others that I have known, happened in April 1725, in N. Lat. 30°. when our boat was hoisted out, and a loggerhead turtle struck as it was sleeping on the surface of the water. This, by our reckoning, appeared to be the mid way between the Azores and the Bahama islands, either of which places being the nearest land it could come from, or that they are known to frequent, there being none on the north continent of America farther north than Florida. It being amphibious, and yet at so great a distance from land in the breeding time, makes it the more remarkable. They feed mostly on shell fish, the great strength of their beaks enabling them to break very large shells, as the large *buccinum* and *trochi*."

36. TESTUDO IMBRICATA; Imbricated or Hawkbill Turtle.

Specif. Char.—Variegated, and having thirteen imbricated scales on the disk.

In this species the outline of the shell exhibits more of a cordated form than any other; and the termination of the shell is more acute. Each of the middle row of scales on the back is also of a sharpened form at the tip, and a ridge runs down the middle. The head is proportionally smaller than in other turtles; and the neck is longer, narrower, and more curved, thus resembling the bill of a hawk; hence deriving its trivial name. The specific name of imbricated is taken from the peculiarity in the disposition of its scales, which overlap each other at the extremities like the tiles on the roof of a house.

The length of this species is about three feet from the tip of the bill to the end of the shell; but some individuals have been found which measured five feet in length, and weighed from five to six hundred pounds; and it is said that some have been met with in the Indian ocean, of enormous magnitude.

The hawkbill turtle is a native both of the American

Turtles. rican and Asiatic seas; sometimes, but more rarely, it is met with in the Mediterranean.

Tortoise shell.

Mode of obtaining

and preparing it.

The ancients employed the shell of this species of turtle for the purpose of a shield; and even at the present day it is used for a similar purpose among rude nations. The flesh of the animal is not held in any estimation as a food; but the plates of the shell being thicker, stronger, and clearer, than those of any other species, render it of great importance as an article of trade. These plates constitute the substance which is well known under the name of *tortoise shell*. Being semitransparent and finely variegated with many beautiful colours, they afford, after proper preparation and polishing, numerous elegant ornaments.

To obtain the tortoise shell, the external coating is separated from the bony part by means of heat. A fire is placed under the shell, the effect of which is to make the plates start, and then they are easily detached from the bone: the thickness of the plates varies according to the age and size of the animal. They measure from one-eighth to a quarter of an inch in thickness. Eight pounds of tortoise shell, it is said, may be obtained from a large turtle. Some even yield, according to other accounts, fifteen or twenty pounds; but unless the weight of the animal itself be equal to 150 pounds, the shell is worth little.

It may, perhaps, not be uninteresting to our readers, to mention the method which is employed by the artist, to give to tortoise shell the particular forms which are wanted for the different purposes to which it is applied. The first part of the process is to soften it sufficiently. This is done by steeping it in boiling water, after which it is introduced into a strong metallic mould of the form wanted, and to this great pressure is applied. When a considerable extent of surface is required, different pieces must be joined together. This is done by scraping the edges of the pieces to be united, thin, and laying them over each other, while they are in the heated and softened state. Strong pressure being then applied, they become completely agglutinated. It is in this way that gold, silver, and other metals, for different ornaments, are made to adhere to tortoise shell.

This substance was greatly sought after by the Greeks and Romans for ornamental purposes. It was not unusual, among the latter people, to see their beds, the doors, and pillars of their houses, decorated with tortoise shell; and especially in the reign of Augustus, when this kind of luxury reached its greatest height.

“The Egyptians, according to Mr Bruce, dealt very largely with the Romans in this elegant article of commerce. Pliny tells us, that cutting them for veneering or inlaying, was first practised by Carvilius Pollio, through which we should presume that the Romans were ignorant of the art of separating the laminae by a fire placed in the inside of the shell when the meat is taken out; for these scales, though they appear perfectly distinct and separate, do yet adhere, and oftener break than split, where the mark of separation may be seen distinctly. Martial says that beds were inlaid with it. Juvenal, and Apuleius in his tenth book, mentions, that the Indian bed was all over shining with tortoise shell on the outside, and swelling with stuffing of down within. The immense use made of it in Rome may be guessed at by what we learn from Velleius Paterculus, who says, that when Alexandria was taken by Julius

Caesar, the magazines or warehouses were so full of this article, that he proposed to have made it the principal ornament of his triumph, as he did ivory afterwards, when triumphing for having happily finished the African war. This too, in more modern times, was a great article in the trade to China, and I have always been exceedingly surprised, since near the whole of the Arabian gulf is comprehended in the charter of the East India Company, that they do not make an experiment of fishing both pearls and tortoises, the former of which being so long abandoned, must now be in great plenty and excellence; and a few fishers put on board each ship trading to Jidda, might surely find very lucrative employment, with a long-boat or pinnace, at the time the vessels were selling their cargo in the port; and, while busied in this gainful occupation, the coasts of the Red sea might be fully explored.”

37. TESTUDO ———, *Green-shelled Turtle*. *La Tortue Ecaille Verte* of Cope.

Specif. Char.—Shell green and variegated.

This species, in general, resembles the common green turtle, both in appearance and manners; but is distinguished from it in having a small rounded head, and never growing to so large a size. It derives its name from the colour of the shell, which is of a fine green, beautifully transparent, and although it is thin, may be applied to many ornamental purposes.

The green-shelled turtle is a native of the fourth seas, and is found near the American rivers within the torrid zone. It is found particularly in great abundance near Cape Blanco in New Spain. The flesh is in great estimation, and is even preferred by some to that of the green turtle.

38. *Trunk Turtle*.

This species is mentioned by Catesby, who says that he never saw it; but from information he has described the upper shell as being more convex than in any other species. It is said that it grows to a very large size.—The flesh is rank; but it yields a great quantity of oil, on which account only it is valued.

39. *Rhinoceros Turtle*. Cope.

This species also bears a strong resemblance to the common turtle; but it is distinguished from it in having a large soft tubercle on the tip of the snout, and in this are placed the nostrils.

This turtle is said to be a native of the American seas, within the torrid zone, and is eaten in the same way as the common turtle.

II. RANA, FROG.

THIS genus has been divided by some naturalists into three genera; and undoubtedly there is some foundation for this distinction, both from the form and structure of their bodies, and from their manners and habits. 1. The *ranæ* or *frogs*, properly so called, and by the French *grenouilles*, have light active bodies, and are furnished with strong limbs, which enable them to perform their motions by leaping. 2. The *hyle*, in French *rainettes*, or tree-frogs, have slender limbs, and have soft tubercles on the toes, by which they can adhere to smooth surfaces,

Frogs.

Frogs.

faces, as to the leaves of trees on which many of them reside. 3. The *toads* or *bufones*, in French, *crapauds*, which constitute the third genus or division, have large heavy bodies, thick short limbs, and a slow crawling motion. But without multiplying genera, we shall consider the whole under one, distributing them into three sections, according to the division which we have just mentioned.

Sect. I. RANÆ, or Frogs.

I. RANA TEMPORARIA, Common Frog.

Specif. Char.—Colour yellowish brown, spotted with black; a lengthened brown patch beneath the eyes.

Of all the European species this is the most common. The general colour is of an olive brown, variegated on the upper parts of the body, with irregular blackish spots. The patch beneath each eye, which reaches to the setting on of the fore legs, seems to constitute one of the principal specific distinctions. The under part of the body is of a pale greenish colour, and but obscurely spotted. But it ought to be observed, that the colour of the frog varies at different seasons of the year, and perhaps in different places. Towards the end of summer, for instance, the colours are much brighter; and as this species frequently casts its skin, the cuticle falling off irregularly from different parts of the body, produces considerable variations in the intensity of the colours.

The frog has a light elegant form, and a lively appearance; the limbs are well calculated for its peculiar motions, and the hind feet being strongly webbed, enable it to swim well. The frog, it is said, does not reach its full size till it is five years old, and it lives from 12 to 15 years. It retires during the heat of summer to the water, and in winter it becomes torpid, and is generally found in the soft mud at the bottom of stagnant waters, or in the cavities beneath their banks, where it remains till the return of spring.

The frog, as well as many other of the reptile tribe, is extremely tenacious of life. It survives for a considerable time, the loss even of some of its essential organs, and it has been found to exist for several days when entirely confined under water.

History of the tadpole.

The frog deposits its spawn in the month of March. This is composed of a gelatinous transparent mass, including the ova or eggs, in each of which is imbedded the embryo or tadpole, which has then the appearance of a round black globule. The period of hatching varies according to the temperature of the season, but it is commonly about a month or five weeks. In its progress the egg becomes gradually larger, and before the tadpole is excluded, it is seen in motion within the surrounding gluten. When they are first hatched, their only food is the remains of the gluten in which they were included. A few days afterwards, if they are minutely examined, a pair of ramified branchiæ, or temporary organs, may be observed on each side of the head, which after a short time disappear. The tadpole, which is so extremely unlike the animal in its perfect state, seems to consist only of a head and tail. The head is large, black, and roundish; the tail is slender, and margined with a broad transparent fin. The motions of the tadpole are very lively. Its food consists of duckweed

Vol. VIII. Part I.

and other small water plants, with different kinds of animalcula. The mouth is furnished with very minute teeth, and when the tadpole has reached a certain size, it may sometimes be heard gnawing the edges of the leaves on which it feeds. By means of a sucker placed between the lower jaw, with which the animal in this state is furnished, it can attach itself at pleasure to the under surface of aquatic plants. When it is very young, it sometimes hangs from this part by means of a glutinous thread, similar to some small flugs.

The internal structure of the organs of the tadpole is very different from that of the future animal. In no respect is this difference greater than in the disposition of the intestines, which are coiled in the form of a flat spiral, like a cable. The first change which appears on the tadpole is at the end of five or six weeks after it is hatched. It is about this time that the hind legs first appear; and gradually increasing in length and size, they are succeeded about two weeks afterwards by the fore legs. These latter, indeed, are formed at an earlier period beneath the skin, and are sometimes protruded and again drawn back by the animal, through a small hole on each side of the breast, before their complete evolution. The tail now gradually decreases, and afterwards more rapidly, so that in the space of a day or two it is quite obliterated. After this change, the animal leaves the water, and covers the banks in myriads. The sudden appearance of such multitudes of young frogs, has probably induced the groundless but popular belief, of their having fallen from the clouds in showers. The frog having now arrived at its perfect form, it changes entirely the nature of its food. It lived formerly on vegetables, now it depends solely for its existence on animal food. It lives chiefly on small snails, worms, and insects. To seize its prey, the structure and position of the tongue are remarkably well fitted. It is of considerable length, and it is attached to the fore part of the mouth, and when at rest it lies backwards. The extremity is bifid, and secretes a glutinous matter, so that in this way it can secure its prey, by darting out its tongue with great celerity, and to some distance from the mouth. This it does with so instantaneous a motion, that it is scarcely perceptible to the eye.

2. RANA ESCULENTA, Green Frog, or Edible Frog of Pennant.

Specif. Char.—Olive colour, spotted with black, with three yellowish lines on the back; abdomen whitish.

This is the largest species of the European frogs. The general appearance resembles that of the preceding; but it is larger in size, and of an olive-green colour, strongly marked on the upper part of the body with roundish black spots. The limbs are elegantly marked with transverse bands of the same colour. Three distinct pale yellow stripes run from the tip of the nose down the whole length of the back, the middle one being slightly depressed; but the two lateral ones are considerably elevated. The head is proportionally larger than that of the common frog.

The green frog is rare in England, but is very common in France, Italy, and Germany, where it is employed as an article of food.

This species, it is observed by naturalists, does not

N n

leave

Frogs.

leave its winter retirement till a much later period than the common frog; and in those countries where it is used as food, it is worth while to attend to this fact, for if they are pretended to be brought to market at an earlier period, the common frog, and sometimes even toads, must be substituted. During the breeding season, the croaking of the male is so loud, that it may be heard at a great distance; and in those places where they are numerous, it becomes so intolerable to those who are unaccustomed to hear them, that they are often deprived of sleep. At this time, too, a large inflected globular vesicle is protruded from each side of the head of the male. The globules of spawn in the green frog are proportionally smaller than in the former species. They have somewhat of a yellowish cast. The progress of the tadpole, towards the evolution of the perfect animal, is considerably slower in this species. The fore legs do not appear before October, and the animal does not assume its perfect shape till the beginning of November. The tail at this time begins to decrease, and in the space of four days entirely disappears.

This species is extremely voracious, seizing, it is said, on young birds of different kinds, mice, and even ducklings, and, as it does with the rest of its prey, swallowing them whole. At the age of four years it has reached its full growth. It begins to breed the year following, and the period of its life is sometimes extended to sixteen years.

3. RANA PAPIENS, *Piping Frog*.

Specif. Char.—Olive-coloured, with ovate black spots, edged with yellow.

This species is smaller than the green frog, but in its general habit bears a considerable resemblance to that animal. From the nose to the tips of the hind feet, it measures only five or six inches. The body and limbs are of a dusky green, spotted with black. Two yellow lines run from the eyes to the rump, and two white lines from each eye to the nose. In the living animal the ears have a bright golden colour.

It is a native of North America. It frequents rivulets and ditches of water, and is so strong and vigorous, that it is said it can leap to the distance of five or six yards. In the spring and beginning of summer, it is supposed to indicate the approach of rain, by a peculiar sound which it emits.

4. RANA CATESBEIANA, *Bull Frog*.

Specif. Char.—Olive brown, spotted with black; large ocellated spots near the ears; hind feet palmated.

This species grows to a very large size, measuring, it is said, more than 18 inches from the tip of the nose to the end of the hind feet. The upper part of the body is brownish, and somewhat irregularly marked with numerous spots of a deeper brown. The under parts are of a whitish cast, with a shade of yellowish green. They are also marked with numerous spots; but these are less bright than those of the upper part.

The bull frog is a native of many parts of North America. It derives its name from the sound of its voice, which resembles the distant lowing of cattle. It usually frequents springs; and in Virginia, where these abound in the sides of the hills, a pair of these frogs are usually

seen sitting on the edge of the small pond formed by the running of the water from the spring; and when they happen to be surprised, they retreat to the mouth of the spring, and, entering it, find themselves in safety. In Virginia, too, a popular opinion prevails, that they are useful in purifying the water of the spring. This opinion is greatly in their favour, and saves them from that persecution with which the frog and other reptiles are wantonly and unnecessarily harassed in other countries. But the bull frog being extremely voracious, and sometimes devouring young ducks and goslings, is occasionally devoted to destruction.

5. RANA OCELLATA, *Argus Frog*.

Specif. Char.—Feet having each five toes, and unwebbed; toes tuberculated beneath; back fasciated, and sides ocellated.

This is one of the largest of the genus, exceeding, perhaps, the bull frog in the size of its body, but having limbs proportionally thicker and stronger. It has sometimes been confounded with the bull frog; but it is distinguished from it in its general appearance, and particularly in the form of the feet.

This frog is a native of Pennsylvania, Carolina, and other parts of North America, frequenting moist places in the vicinity of springs and rivulets. In its manners and habits it is supposed to be nearly the same with the bull frog.

6. RANA VIRGINICA, *Lineated Frog*.

Specif. Char.—Cinereous, spotted with red; beneath yellowish; back angular, and marked with five pale stripes.

This species, in shape, size, and structure of the feet, resembles the common frog. It is greenish above, and paler beneath. The back and limbs are variegated with dark-brown marks of different sizes.

It is a native of Virginia.

7. RANA OVALIS, *Oval Frog*.

Specif. Char.—Colour brownish, beneath yellowish; the head beaked, and scarcely distinct from the globose body.

The snout projecting beyond the lower jaw, constitutes the specific character. The hind legs are short, the feet unwebbed, and there is a callus at the base of the inner toe. Its native country is unknown.

8. RANA CYANOPHLYETIS, *Studded Frog*.

Specif. Char.—Brownish blue, having a tuberculated line on each side; beneath whitish, spotted with brown.

In this species the legs are banded with blackish blue and white. In the upper jaw there is a row of thickset conical teeth, resembling those of lizards. The hind feet are webbed, and furnished with a callus like a sixth toe.

It is a native of India.

9. RANA SPINIPES, *Spiny-footed Frog*.

Specif. Char.—Brown, beneath bluish; sides speckled with

Frogs.

with an ochreous colour; toes of the fore feet furnished with spines.

This species is larger than the common frog. The feet are unwebbed, and in its habit it approaches to the toad.

It is a native of New Holland.

10. RANA CERULEA, *Blue Frog*.

Specif. Char.—Blue, speckled, with grayish beneath; feet divided into four toes; hind feet webbed.

The blue frog is of the size of the common one. The toes are not orbiculated; but in its habit and slender limbs it approaches somewhat to the tree frog.

It is a native of New South Wales.

11. RANA VESPERTINA, *Vespertine Frog*.

Specif. Char.—Cinereous, and tuberculated above; a transverse spot between the eyes, and forked behind; marked with longitudinal, subconfluent, brown dorsal spots, which vary into green.

In this species the head is short, and the body is covered with warts or papillæ. It is about the size of a toad, having the habit of a frog. It can scarcely be said to leap.

It is a native of Siberia.

12. RANA RIDIBUNDA, *Laughing Frog*.

Specif. Char.—Cinereous, the body spotted with brown, the thighs dusky, with milk-white spots.

This species is of a very large size, weighing half a pound. It has the habit of the common frog, but is broader.

It is very frequent about the rivers Wolga and Ural, and the Caspian sea. It never leaves the water. In the evening it emits a sound, somewhat resembling a hoarse laugh, whence it derives its specific name.

13. RANA SITIBUNDA, *Thirsty Frog*.

Specif. Char.—Glaucous gray, variegated with blackish green spots; beneath whitish; the hind feet semipalmated, and having the appearance of seven toes.

The body is warted, the head short, and has the general habit of a toad, but is larger. There are two curious toes on the hind feet.

It is a native of desert places about the river Ural. It conceals itself during the day.

14. RANA LEVERIANA, *Leverian Frog*.

Specif. Char.—Dusky blue, whitish beneath; hind feet palmated, body marked above, with two long and two short white stripes.

Excepting that the body is plumper, and the limbs proportionally shorter, this species has the habit of the common frog. On the back of the head there is a small trifurcated spot, two upper divisions of which point forwards. The lower surface of the body is yellowish white and granulated. The fore feet have four toes, which are slightly orbiculated at the tips.

Its native country is unknown.

15. RANA IGNEA, *Fire Frog*. *Rana Bombina*, Lin.

Frogs

Specif. Char.—Olive brown, orange colour beneath, spotted with blue.

This is the smallest of the European frogs, and is not equal even to the tree frog in size. It derives its name of fire frog from the peculiar colour of the under surface of the body; but this is subject to considerable variation.

It is a native of Germany, Italy, and other parts of Europe, but has not been found in England. It frequents turbid stagnant waters, and scarcely ever appears on land. It breeds at the age of three years, and may therefore be supposed to live about ten. It deposits its spawn in the month of June, and the ova are proportionally larger than those of others. The tadpoles, which are of a pale yellowish brown colour, are hatched towards the end of June. When young, they have been frequently observed to hang from the surface of leaves by means of a glutinous thread, issuing from the small tube near the lower lip. About the end of September they are at their full size. At that time the tail appears more fleshy and muscular, and therefore proportionally stronger than in other tadpoles. In the beginning of October they assume their perfect form.

This is one of the most active and lively of the whole genus. It leaps and swims even with greater celerity than the common frog. When it is surprised on the land, and finds that it cannot escape, it squats down close to the ground, turning back its head and limbs in a singular manner. If it be farther disturbed, it emits from the hinder part of the thighs a frothy kind of fluid which has no disagreeable smell, but some degree of acrimony when it comes in contact with the eyes and nostrils. The sound emitted by the male of this species is sharper than that of other frogs, and somewhat resembles a kind of laugh, or according to some, the note of a cuckoo or the tone of a bell. Hence the Linnæan specific name, *rana bombina*.

16. RANA SALSA, *Saline Frog*.

Specif. Char.—Colour olive brown, whitish beneath, with dusky variegations: all the toes are unwebbed.

When this species is first taken out of the water, the brown colour has a shade of blue; the back is beset with tubercles; the legs are fasciated with brown, and the insides of the feet are yellow.

It is a native of the salt marshes of some parts of Germany.

17. RANA PARADOXA, *Paradoxical Frog*.

Specif. Char.—Yellowish and olive-coloured; variegated with rufous bands; hind legs obliquely striated.

This species resembles in its general form the common frog. The oblique longitudinal stripes on the hind legs constitute the principal mark of distinction. There are four toes on the fore feet, and they are unwebbed. The hind feet have five toes, and are deeply palmated to the very ends of the toes. Near the shortest toe there is an oblong callus, forming a spurious one. The upper jaw is beset with a row of small denticulations.

This species is a native of South America, and is more common in Surinam than in other places.

Naturalists have been extremely puzzled with regard to the real nature of what has been taken for the tadpole of this frog. At one time it was considered by Einnæus as a species of lizard, and therefore arranged by him under the genus *Lacerta*. At another time he has placed it under the present genus, with the specific name *piscis*. It was described by Edwards under the denomination of the *frog fish of Surinam*. The structure of the animal, which has been the subject of so much discussion, shews clearly that it is the larva or tadpole of a frog; and it is supposed, with no small degree of probability, that the differences in the accounts given of this animal by naturalists have arisen from the different stages of its progress in which it has been found. But as this tadpole is so much larger in size, in proportion to the perfect animal, than any other species yet known, it may be the larva or tadpole of some of the larger species, and not that of the rana paradoxa, which is but a small frog.

SECT. II. TREE FROGS.

Tree frogs have slender bodies, long limbs, and the tips of the toes are flat, orbicular, and dilated. The species included under this section have been formed, according to the arrangement of some naturalists, into a separate genus, under the name of *Hyla*; and no doubt the peculiar structure of the toes, which enables them to adhere to smooth bodies, affords a very striking character, and in some measure warrants the arrangement.

18. RANA ZEBRA, Zebra Frog. *Rana Maxima*, Linn.

Specif. Char.—Yellowish and rufous, spotted and fasciated with brown. There are double bands on the legs, and the feet are palmated.

This species is the largest of the whole of this section, measuring about five inches from the nose to the end of the body. The colour is an elegant, pale, rufous brown, beautifully marked on the back and limbs, and even to the very ends of the toes, with transverse chefnut-coloured bands. The head is large, the eyes protuberant, and the mouth wide. The fore feet have four toes, and the hind ones five.

It is a native of Carolina and Virginia.

Two other species have been described by naturalists, which more accurate observation has shewn to be nearly allied to the preceding. The first is the *rana boans*, Linn. in which the difference is so slight, that as Dr Shaw observes, it may depend on a sexual distinction. The other is the *rana venulosa*, which is supposed to be the same animal as the zebra frog, before it has arrived at its full size.

19. RANA BICOLOR, Blue-and-Yellow Frog.

Specif. Char.—Colour blue, ochreous beneath; feet unwebbed; toes flattened and orbicular.

This elegant species is of a moderate size; it measures more than four inches in length. The whole of the upper surface is of a beautiful blue, while the under parts are of a pale orange or ochre colour. The head

is large, the mouth wide, and the tip of the nose truncated. All the toes are furnished with a large orbicular tip; and beneath each of the joints there is a process or tubercle. The upper parts of the female have a deeper shade of violet than those of the male.

It is supposed to be a native of Surinam.

20. RANA LEUCOPHYLLATA, White-Leaf Frog.

Specif. Char.—Colour rufous, variegated above, with snow-white spots of different shapes.

The variegated spots on the body and limbs are milk-white, and are observed to vary greatly in different individuals, in number, form, and disposition. The toes of the fore feet are slightly webbed at the base.

It is a native of America.

21. RANA QUADRILINEATA, Four-Lined Frog.

Specif. Char.—Colour blue, having a double, longitudinal, yellow line on each side of the body.

This species bears a near resemblance to the preceding, but the blue colour above, and the double yellow line, which runs along each side of the body, from the eyes to the vent, sufficiently distinguish it.

Its native country is unknown.

22. RANA CASTANEA, Chefnut Frog.

Specif. Char.—Chefnut-coloured and granulated; whitish beneath, with a white line on each side of the body.

In this species, the whole of the upper surface, both of body and limbs, is scattered over with minute warts or tubercles. On each shoulder there is a large, long, white spot; the fore arms, hind legs and thighs are barred transversely with white; the feet are unwebbed, the toes rounded, and all the joints tuberculated beneath.

It is supposed to be a native of Surinam.

23. RANA FASCIATA, Fasciated Frog.

Specif. Char.—Colour rufescent, with whitish transverse bands.

In this species the colour is pale rufous; the head, body, and upper parts of the limbs, are marked with pale, transverse bands; the eyes are blue, with a silvery lustre; the outside of the arms and legs are of a blackish brown colour.

Its native place is unknown.

24. RANA ARBOREA, Tree Frog.

Specif. Char.—Colour green, whitish beneath, with a blackish lateral line and granulated abdomen; feet unwebbed.

This species is of a smaller size than any other of the European frogs. The colour of the upper part of the body is green; the abdomen is whitish, and marked with numerous granules. The under surface of the limbs is reddish, and on each side of the body there is a longitudinal blackish or violet-coloured streak, which separates the green of the upper parts from the white of the lower. The lower edge of the dark lateral stripe is shaded with yellow. The hind legs are long and slender. There are four toes on the fore feet, and five on the

Frogs.

the hind feet. All of the toes terminate in flat, round, and dilated tips. It is by means of this peculiar structure that the animal is enabled to hang from the leaves of trees, or from any smooth substance; for the under surface of these tips or tubercles on the toes is soft and glutinous. There is a similar structure on the skin of the abdomen.

The tree-frog is a native of France, Germany, Italy, and other parts of Europe. It has never been found in the British islands. During the summer months, it chiefly frequents the upper parts of trees, and wandering among the leaves in search of insects, it seizes them with extreme celerity. It steals softly towards its prey, and when it has reached the proper distance, it makes a sudden spring of more than a foot in height. For this it is peculiarly fitted, from its nimble and active movements. It conceals itself beneath the shade of the leaves, by attaching itself to their under surface by means of the feet, or abdomen.

On the approach of winter, the tree frog leaves the woods, and retires to the waters, where it buries itself in the soft mud, or conceals itself beneath the banks, where it remains torpid till the spring, when it deposits its spawn in the water. At this time the throat of the male is greatly inflated, and the loud sharp croak which it then emits, is heard at a very considerable distance. The spawn is deposited in small clustered masses, about the end of April, and the tadpoles assume the form of the perfect animal about the beginning of August, at which time they begin to ascend the neighbouring trees, where they reside while the warm season continues. It has been observed that they are more noisy on the approach of rain; and the males particularly, if kept in glasses, and furnished with food, afford certain indications of the changes of the weather.

25. RANA MERIANA, *Merian Frog*.

Specif. Char.—Colour yellowish green, variegated with brown, with conically shaped, auricular vesicles.

This species is three times the size of the common tree frog, and on each side of the neck there is a remarkable protuberance like an obtusely conical, inflated pouch.

This species is sometimes found on trees, and sometimes in the water, according to the different periods of its growth. According to Madame Merian's description, these frogs are found in stagnant waters. They have, she observes, ears in their heads, and knobs or balls on their feet, which have been given them by nature to enable them to pass easily over the morassy places which they inhabit.

26. RANA AURANTIA, *Orange Frog*.

Specif. Char.—Orange-coloured; body and limbs very slender.

This species is entirely of a reddish orange colour, long-limbed and slender-bodied. It is smaller than the European tree frog.

It is a native of South America, inhabiting trees.

27. RANA TINCTORIA, *Tinging Frog*.

Specif. Char.—Of a reddish colour; the body fasciated with white.

Toads.

It is of a bright red or ferruginous colour above, marked longitudinally with a pair of white stripes. These at an early age are often crossed with a transverse stripe; and indeed the individuals of this species have been found to vary greatly in the disposition of the colours.

It is a native of South America, and inhabits trees.

The Indians employ this species of frog to change the colour of green parrots. For this purpose they pluck the feathers from that part of the parrot on which they wish the new colour to be introduced. They rub the skin with the blood of the animal, and the renovated feathers, instead of being green as formerly, are yellow or red.

28. RANA ALBA, *White Frog*.

Specif. Char.—Entirely of a white colour.

On the upper part of the body there are some spots or patches, which are of a brighter white than the ground. It is, however, subject to some variations.

It is a native of the woods in the warmer parts of North America.

29. RANA BILINEATA, *Bilineated Frog*.

Specif. Char.—Colour green, with a straight yellow line on each side of the body.

The only difference between this species and the common tree frog is, in the yellow line on each side of the body of the former being somewhat straighter, and without undulations.

It is a native of the warmer parts of North America, inhabiting the woods.

SECT. III. TOADS.

30. RANA BUFO, *Common Toad*.

Specif. Char.—Colour brown, with reddish brown tubercles, pale beneath.

The common toad is too well known to require any detailed description. The colour is generally of an obscure brown above, but much paler, and irregularly spotted beneath. It is, however, subject to considerable variations, being sometimes found of an olive cast; and in the earlier part of summer, the shoulders and limbs are marked with reddish spots, while the under parts of the body have a yellowish tinge. The body is always covered with pustules or tubercles of a darkish green, or bright red colour, and they are of different sizes in different individuals. The common toad is not only a native of Europe, but of other countries of the world.

The common toad usually frequents shady places, in gardens or fields; is found under stones, or makes its way into cellars or other obscure recesses, anxious, as it would seem, to conceal itself, or, that it may lie protected from excessive cold, and find a supply of food. The toad, like the common frog, becomes torpid in winter; and it would appear, that they sometimes collect together in numbers, and take up their habitation in the same hole or cavity, with the view of preserving and retaining their heat for a greater length of time. At the return of spring, the toad leaves its lurking place, and retires to the waters, where it deposits its spawn.

Toads. spawn. The ova are included in a transparent gluten, which is in the form of chains or strings, somewhat resembling a necklace. The length of these strings is from three to four feet; and through the whole length the ova, which have the appearance of black globules or beads, are disposed in a double series. The tadpole is hatched at the end of 14 or 15 days, according to the temperature of the season; and having burst from the surrounding gluten, they swim about in the water, feeding on different animalcules, and leaves of water plants. Early in the autumn they assume the form of the perfect animal, when they retire from the water, and are sometimes found in such numbers on the ground in its vicinity, that it has probably given rise to the common opinion of their having fallen from the clouds in showers.

Age. The age of the toad is supposed to be about 15 or 20 years, but sometimes they exceed this period. One, of which Mr Pennant has given an account in his British Zoology, lived to the great age of 40 years. This individual had been known for that time in a domesticated state. It was kept by a Mr Ascot in Devonshire, and had become so tame, that it left its hole at the approach of its master, to receive food. It grew to a very large size, and had become an object of so much curiosity, that in spite of the aversion and horror which this animal usually inspires, it was visited by all, and even by ladies, who came to the house. It was frequently brought to table, and fed with insects, and without any degree of embarrassment, or seeming desire to get away, it seized them with great celerity. Its usual place of residence was under the steps of the door of the house which led to the garden. It was unfortunately seized by a raven, and severely wounded, before it could retreat to its hole; and although it was liberated from its enemy, and lived for more than a year afterwards, it never recovered its usual health and vigour, otherwise the period of its life might have been greatly extended.

It has been long supposed that the toad, when it is irritated, secretes a fluid from its skin which is of a poisonous quality. This fluid, however, has no effect whatever, except producing a little irritation, on larger animals. A dog, it has been observed, carrying a toad for a short time in his mouth is affected with a slight swelling of the lips, and an increased discharge of saliva. This fluid undoubtedly answers some purpose in the economy of the animal, and it is probably intended for its protection against the troublesome attacks of smaller animals. This seems to be in some measure proved from the experiments of Laurenti. In these experiments it appeared that small lizards which had bitten the common toad, became disordered, and paralytic, and even apparently dead. They were, however, completely recovered in the space of a few hours.

Many wonderful stories have been related of the toad having been found inclosed in the solid substance of wood and stone, or marble; and what is still more wonderful, that it has been in such circumstances without any visible outlet, or the smallest passage for the access of air, alive, and seemingly uninjured. It is not indeed a little surprising, that a supposed fact of this kind, so contrary to the nature of animal existence, should even for a moment have gained any degree of belief; yet many such stories have been currently reported, and readily, we might almost say, universally admitted to be true; for being established on what was said to be the most un-

doubted testimony, they were received and acknowledged as fully authenticated. But on closer investigation, in all cases where inquiry could be made, it was found that some links in the chain of evidence were always wanting. In no instance whatever, it may be asserted, has the fact been ascertained from direct information, founded on any credible or respectable authority. It has always been first communicated by report, or from a distance; circumstances which always give room for mistake and error. Toads may have been found inclosed in wood, or even in stone, perhaps without having received any material external injury; but that they should have remained in such situations for any great length of time, as for years, nay, in some cases, for hundreds of years, totally deprived of food, and completely excluded from all access of air, is not only highly incredible, but impossible. But if farther evidence were necessary, this supposed fact is fully disproved by the experiments of Herissant, which he performed in presence of the French Academy. It had been asserted that a living toad was found in the year 1771, in a wall at a seat belonging to the duke of Orleans. The wall, which was then pulled down, had been built 40 years; and its hind feet were found imbedded in the mortar. In Herissant's experiments, three toads were inclosed in separate boxes, and these were immediately covered with a thick coat of mortar, and kept in the apartments of the academy. At the end of 18 months the boxes were opened, and two of the toads were found living. They were again enclosed; but being re-opened after some months had elapsed, they were found dead.

31. RANA ALLIACEA, *Alliaceous Toad.*

Specif. Char.—Colour pale gray, marked with brown, and having a whitish dorsal line; pupils perpendicular.

This species, excepting in a greater proportional length of the head, has a considerable resemblance to the common toad. It differs from it also in being nearly smooth. The colour above is a brownish gray, with spots of deep brown, which on the sides are disposed in a reticular form. The eye has a very peculiar structure. The form of the pupil, when the eye is contracted, is perpendicular, as in the eyes of cats. On the hind feet there is a spurious claw, or horny callus, situated beneath the heel.

This animal gives out, when irritated, a peculiar odour, which resembles that of onions or garlic, and produces a similar acrid effect on the eyes. A smell like that of the smoke of gunpowder is also sometimes combined with the garlic smell.

This species is a native of Germany. It is found in the neighbourhood of Nuremberg.

It has been already mentioned, that the spawn of the common toad is deposited in the form of a double string; but in this species there is only one string, which is of considerable thickness, and the numerous ova are disposed, not in a double row, as in the former, but in a confluent manner through the length of the spawn, which is sometimes found nearly two feet long.

The tadpole of the alliaceous toad, like the supposed one of the *rana paradoxa*, is considerably larger in size than the young frog when it has first assumed its perfect form.

Not poisonous to large animals.

Error concerning its being found alive enclosed in solid substances.

Toads form. Indeed it is so large, that in the vicinity of the places where it is found, it is employed as food by the country people, who consider it as a kind of fish. It seems also to be one of the most voracious tadpoles.

The alliaceous toad, contrary to the habits of the common toad, remains almost constantly in water, and but very rarely appears on land. It is also more lively and active in its nature, and its motions are performed by a kind of leaping, rather than by the crawling sluggish pace of the latter.

32. RANA MEPHITICA, *Mephitic Toad.*

Specif. Char.—Colour olive, spotted with brown; warts on the skin reddish; dorsal line sulphur-coloured.

Excepting in the colour, and being of a smaller size, this species greatly resembles the common toad. The body and limbs are short and thick; the fore feet are furnished beneath with a pair of bony processes, by means of which it is enabled to climb up the sides of walls. The hind feet have no webbed structure. In its motions it runs somewhat like a mouse. It comes out only in the night, from the cavities of walls and rocks, where it conceals itself by day.

This species is a native of Germany, in some parts of which it is known by the name of *roerhling*, or reed frog, because in the spring it frequents places which are overgrown with reeds. At this season, too, it is well known by the strong and peculiar note or croak which it utters.

In the month of June, when this species breeds, it resorts to the water, to deposit its ova. These are emitted, as is the case with the common toad, in double rows, in a pair of long glutinous strings; and so rapid is the progress of hatching, that the tadpoles appear in the space of five or six days, having separated themselves from the spawn. The hind legs appear about the end of August, are soon succeeded by the fore legs, and by September or October the animal has assumed its complete form.

The mephitic toad has derived its name from a most offensive smell which it diffuses when it is irritated. This odour proceeds from a white acrid fluid which exudes from the pores of the skin. The animal has the power of emitting this fluid to the distance of three or four feet, and it is said that if it fall on any part of the room where the animal is kept, it will scarcely be entirely dissipated for two months afterwards. This odour resembles the smoke of gunpowder, but is considerably stronger; or that of the fumes of arsenic.

Var. The natter-jack of Pennant is, according to some, a variety of the above species. It is not, however, said, that, like the mephitic toad, it emits any peculiarly offensive odour; but its running motions bear a near resemblance; for it does not leap, nor does it crawl with the sluggish pace of the common toad.

It is a native of England, and is found in Pulteny common, and near Reevesley abbey in Lincolnshire, frequenting dry and sandy places.

33. RANA VIRIDIS, *Green Toad.*

Specif. Char.—Colour pale, varied with greenish spots; tubercles reddish. *Rana variabilis*, Linn.

In this species the green spots or patches are bounded

with a blackish margin, and the whole has somewhat of the appearance of a map. The spots on the legs and thighs are transverse, forming a kind of bars; the eyes are remarkable for a beautiful golden colour, and when the animal is irritated, seem to emit a kind of phosphoric light.

This species is a native of Germany and other parts of Europe, and is not unfrequently found about Vienna, where it inhabits the cavities of walls.

This species, like the mephitic toad, emits a very strong odour, which resembles that of garden nightshade. It is so powerful, that it diffuses itself through a large room.

During the breeding season this species frequents the waters, and in winter it retires under ground. Its croaking is said to resemble the creaking of the hinge of a door. It would appear, that the fluid which exudes from the skin of this toad, and probably also from that of others, is poisonous to small animals; for it is said that the smaller kinds of the gray lizard, on biting this toad, became immediately strongly convulsed, and died in a few minutes.

34. RANA MARINA, *Marine Toad.*

Specif. Char.—Colour yellowish brown, with a large porous prominence over each shoulder; very large size.

This species even exceeds the bull frog in size. On each shoulder there is a protuberance of a light-brown colour, which is marked with many pores. These are the parotid glands, which are peculiarly conspicuous. The feet have no webs, and there are four toes on the fore feet, and five on the hind. The toes are furnished with claws, somewhat resembling the human hair. There are some tubercles at the extremity of the body, which are said to be owing to the folding of the skin, when the animal is placed in a particular attitude; for these disappear when the attitude is changed.

This species is said to be a native of America; and, according to some, is calculated to live both by land and sea.

35. RANA DUBIA, *Doubtful Toad.*

Specif. Char.—Colour yellowish brown, warty, having a large porous prominence over each shoulder; hind feet subpalmated and subhexadactyle.

In size this species comes near that of the common toad; but it is different in shape, as it tapers from the shoulders to the hind legs like the tree frogs. The upper surface of the body is covered with oval tubercles, and there are protuberances on the shoulders like the *rana marina*. The under parts of the body are also beset with smaller tubercles. The joints of the toes of the fore feet are tuberculated beneath, and there are two remarkable protuberances under the foot.

Of the native country of this species, or of its manners and habits, nothing is yet known.

36. RANA TYPHONIA, *Mitred Toad.*

Specif. Char.—Colour brown, dorsal line whitish; head triangular.

This species is about the size of the common toad; the

ads.

the thighs are barred with brown, and the skin of the whole body is covered with numerous small protuberances of a pearly colour. The sides of the head beyond each eye have somewhat of an angular appearance, and from this it has derived the name of *mitred toad*.

37. RANA BRAZILIANA, *Brazilian Toad*.

Specif. Char.—Colour rufous, with numerous brown spots on every part of the body.

In its general appearance this species resembles the common toad, but is much larger, and the head is proportionally shorter. The spots or stripes on the body are red brown, placed transversely, and are somewhat waved.

It is a native of South America; but, according to some, has been found in the island of Cuba.

38. RANA VENTRICOSA, *Granulated Toad*.

Specif. Char.—Colour pale brown; abdomen dilated, and marked on the sides with blackish spots.

In this species the head and eyes are large, the mouth wide, the body somewhat depressed; the abdomen is very broad; the limbs are rather short. The upper surface of the body and limbs is covered with tubercles of different sizes, pretty distinctly arranged.

It is supposed to be a native of Brazil.

39. RANA CORNUTA, *Horned Toad*.

Specif. Char.—Colour cinereous, banded with brown; eyelids conical.

In this species a broad white band runs along the back, from the head to the extremity of the body, and becoming gradually narrower. It is covered with small specks like pearls. The rest of the body, excepting the head, is rough, with sharp points. The head is large and thick, and a broad thick tongue appears when the mouth is opened. It is covered with papillæ, and fastened to the anterior part of the lower jaw. The gape of the mouth extends almost half the length of the body; the eyes are rather small, and are placed nearer than in other frogs. Each of the upper eyelids rises up into a large conical callus, or horn. From this extraordinary width of the mouth, and singular structure of the upper eyelids, this species exhibits the most deformed and hideous aspect of any of the whole tribe.

It is a native of South America.

40. RANA PIPA, *Pipa*, or *Surinam Toad*.

Specif. Char.—Colour brown; toes of the fore feet quadrifid at the extremities.

This species is considerably larger than the common toad. The body is flattish; the head somewhat triangular; the mouth wide, and the corners are furnished with a kind of rugged appendage. There are four long thin toes on the fore feet, and each of the toes is divided into four distinct processes; and these, when minutely examined, are found to be still farther divided. The hind feet have five toes, and are webbed to the tips. The male is larger than the female, measuring sometimes seven inches from the tip of the nose to

the extremity of the body. The nose in both sexes is truncated, and the eyes very small.

This singular species is a native of Surinam.

The economy and habits of the pipa greatly occupied the attention of naturalists for a long time after it was first known to Europeans, which was about the end of the 17th century. It was then supposed that the ova were produced in cells on the back of the animal, without being first excluded, as in the other species of this tribe, in the form of spawn. But future observers have added new facts, and greater accuracy to the natural history of this species; and it is now found, that the spawn being excluded in the usual manner, is received into a number of open cells on the back of the animal, and is there retained till the young have reached some degree of maturity. This discovery is owing to Dr Fermin, who made his observations on the spot, during a residence at Surinam. The female pipa, he observes, deposits her spawn near stagnant water. The male collects the ova, and places them carefully on the back of the female, where, after being impregnated, they are pressed into the cells, which are then open to receive them. The cells close over them, and retain them for near three months, when the young animals, having arrived at their perfect state, emerge from the back of the parent. During this period of concealment, it has been discovered by other naturalists, that the ova undergo the same change as in those which are hatched out of the body; first assuming the form of the tadpole, and then acquiring the complete shape before they are excluded from the cells. In this mode of hatching its young, some naturalists have observed an analogy in this process of nature between the Surinam toad and the

opossum.

This animal, from the uncouthness of its shape, and its general appearance, will, by many, be considered at first view as little less hideous and deformed than the horned toad.

41. RANA BREVICEPS, *Short-headed Toad*.

Specif. Char.—Colour brown, pale beneath; body ovate, convex, and marked with a longitudinal, ash-coloured, dentated band. *Rana gibbosa*, Linn.

This is a small species, and scarcely exceeds half the size of the common toad. The head is very small, obtuse, and sunk in the thorax. The toes of the fore feet are unwebbed, have no claws, and are furnished with tubercles beneath the joints. The hind feet are furnished with six toes.

It is a native of Senegal, and some other parts of Africa.

42. RANA SYSTEMA, *Indistinct Toad*.

Specif. Char.—Body somewhat globose; head indistinct and mouth small.

In its general appearance this species greatly resembles the preceding. The body is thick and roundish, and the head is so little distinguished from the body, that the mouth is scarcely perceptible. The legs are very short, and the thighs seem enclosed in the wrinkled skin of the sides. The whole body is smooth.

It is a native of the East Indies.

43. RANA ACEPHALA, *Headless Toad*.

Specif. Char.—Colour brownish, marbled with white; head indistinct, and mouth very small, bending downwards.

Excepting in the colour, which is very different, and in the head being still less distinguished from the body, this species in appearance comes very near the two former. The mouth also is smaller, and is curved downwards at each corner. Its native country is unknown.

44. RANA LENTIGINOSA, *Carolina Toad*.

Specif. Char.—Colour gray, freckled with brown; head somewhat pointed.

This species in its general appearance greatly resembles the common toad, excepting that the head is smaller, and the snout sharper. The colour is of a dusky brown, mottled with minute blackish or dark-brown spots. In its motions this species is different from the common toad, for it leaps rather than crawls.

It is a native of North America, and particularly of Carolina and Virginia. It is said to be most common in wet weather, and frequents the higher grounds, appearing not only in the evening, but even in the hottest part of the day.

This species, like others of the same tribe, feeds on insects, and seems to be extremely fond of luminous insects, as fire-flies, glow-worms, &c. It is said that it will seize a piece of live wood coal, mistaking it for a luminous insect, and swallow it, seemingly with impunity.

45. RANA SEMILUNATA, *Crescent Toad*.

Specif. Char.—Colour blackish, paler beneath; a white crescent-shaped spot at each ear.

This species is larger than the common toad, and is particularly distinguished by a large, round, white spot behind the parotids. The body is covered above with tubercles.

46. RANA MELANOSTICTA, *Black-lipped Toad*.

Specif. Char.—Colour yellowish brown; warts black, speckled; upper lip and eyelids edged with black; hind feet subhexadactylous and semipalmated.

This species is nearly the size of the common toad, and resembles it in its general appearance. The space between the eyes is depressed and smooth. The edges of the projecting orbits of the eyes are black; the upper jaw is surrounded with a similar border, and the tips of the toes and the two tubercles of both hind and fore feet are also black.

It is supposed to be a native of China.

47. RANA ARUNCO, *Arunco*.

Specif. Char.—Body warted; all the feet webbed.

This species is nearly of the same colour as the common frog, but it is larger in size. The body is warted, and all the feet are palmated.

It is a native of Chili.

VOL. VIII. Part I.

48. RANA LUTEA, *Yellow Toad*.

Specif. Char.—Colour yellow; feet subpalmated.

In its general habit this species resembles the common frog, but is smaller in size. The skin is covered with warts, and all the feet are subpalmated.

It is also a native of Chili, and frequents the waters.

III. DRACO, DRAGON.

Gen. Char.—The body is four-footed, and is furnished with a tail: on each side there is an expansile, radiated, wing-like skin.

1. DRACO VOLANS, *Flying Dragon*.

Specif. Char.—The fore legs are unconnected with the wings.

The flying dragon, in many respects, both in its structure and habits, resembles the tribe of lizards; but on account of the expansile cutaneous processes with which the sides are furnished, Linnæus has arranged it under a distinct genus.

The body of this animal is about four inches in length; but from the tip of the nose to the extremity of the tail, it is commonly about nine or ten inches, and sometimes a foot. The form of the head is very singular; it is furnished beneath with a large triple pouch or process, one part of which hangs beneath the throat, while the other two project on each side. They are all sharp-pointed, and are more conspicuous, in proportion to the size of this animal, than the same processes in lizards. The mouth is wide; the tongue large and thick at the base; the teeth are small and numerous; the neck is also small; the body and limbs are slender, and entirely covered with small pointed scales. On the upper part of the body the colour is pale blue, or bluish gray; but the back and tail are marked with transverse dusky bars. The wings are elegantly spotted with patches of black, deep brown, and white, of different forms. The under surface is of a whitish-brown colour.

The flying dragon is a native of Asia and Africa, where it is found frequenting trees; and for this it is peculiarly adapted, from the cutaneous processes with which it is furnished on each side. For by means of these lateral membranes, it is enabled to spring with more facility from branch to branch, and even to support itself for some time in the air, like the bat or flying squirrel. Like the lizard, it feeds on insects.

2. DRACO PRÆPOS, *American Flying Dragon*.

Specif. Char.—Wings united with the arms.

This species is considered by some naturalists only as a variety of the former. The circumstances in which it differs are, that the body and neck are more slender, and the pouch at the throat is single.

It is said to be a native of America.

The real dragon of modern naturalists, it may be observed, is not that terrible and destructive monster, the mere creature of imagination, which existed only in the descriptions of romance, and the older poetry; nor is it

Lizards.

the animal which we find described and figured in some of the writings of the older naturalists. For these, it is now well known, are either entirely fictitious beings, or have been prepared artificially, by joining together the limbs of different animals; and thus producing a monster, under the name of dragon, unknown in nature. This has been done by warping some species of the skate tribe, into what was supposed to be the shape of a dragon, and having raised the fins, and dried them in this position, by adding the legs of birds or other animals. Hence have originated the monstrous representations, which are found in some of the older naturalists, of many-headed dragons, having necks and tails like those of snakes, and feet like those of birds. Deceptions of this kind, it would appear, have been often successfully practised, by which means, not only the vulgar, but also men of science, have been misled and imposed upon. The following is an instance of this kind, which happened about the end of the 17th century. It is quoted by Dr Shaw, and he observes, is thus commemorated by Dr Grainger from a note of Dr Grey, in his edition of Hudibras, vol. 1st. page 125.

“Mr Smith of Bedford observes to me on the word dragon, as follows: Mr Jacob Bobart, botany professor (or rather superintendant of the garden) of Oxford, did about 40 years ago, find a dead rat in the physic garden, which he made to resemble the common picture of dragons, by altering its head and tail, and thrusting in taper sharp sticks, which distended the skin on each side, till it mimicked wings. He let it dry as hard as possible. The learned immediately pronounced it a dragon, and one of them sent an accurate description of it to Dr Magliabechi, librarian to the grand duke of Tuscany. Several fine copies of verses were wrote on so rare a subject; but at last Mr Bobart owned the cheat; however, it was looked upon as a masterpiece of art, and as such deposited in the museum or anatomy school, where I saw it some years after.”

We shall relate another instance of an artificial dragon, with which a similar deception was practised, and which was detected by Linnæus. This dragon was in the possession of a merchant at Hamburgh, and was valued by the proprietor at 10,000 florins. Linnæus, while he was on a visit to that city, detected the cheat, and shewed that it was entirely an artificial animal, composed of the skins of snakes, the teeth of weasels, the claws of birds, &c. It is even said, that Linnæus having made this discovery, was obliged to make a precipitate retreat from Hamburgh, to avoid a prosecution which was threatened by the proprietor on the score of the reputation and value of his property being injured by this discovery.

IV. LACERTA, LIZARD.

Gen. Char.—The body is four-footed, elongated, and furnished with a tail; there is no secondary integument.

The numerous genus *Lacerta* includes a great variety of animals which, although they possess many characters in common, yet they exhibit considerable differences, not only in their economy and habits, but also in structure and external form. On this account this genus has been divided by some naturalists into a number of dis-

tinged genera. We have here, however, according to the Linnæan arrangement, retained the whole under the same genus; but we shall divide the species comprehended under it, as other naturalists have done, into different sections, as follows: 1. Crocodiles; 2. Guanas; 3. Cordyles; 4. Lizards proper; 5. Chamelions; 6. Geckos; 7. Scinks; 8. Salamanders, Newts, or Efts; 9. Snake Lizards.

SECT. I. CROCODYLES.

The character of the animals included under this section is, that they are furnished with very strong scales.

I. LACERTA CROCODYLUS, *Common Crocodile, or Crocodile of the Nile.*

Specif. Char.—Head mailed; neck carinated; tail furnished on the upper part with two lateral crest-like processes.

The crocodile sometimes arrives at a very great size. Individuals of 20 feet long have frequently been seen, and instances are mentioned of some which have exceeded the length of 30, and even 40 feet. When it is full grown, the colour of the upper part of the body is blackish brown; beneath it is yellowish white. The upper parts of the legs and sides are varied with deep yellow, and in some parts tinged with green. The colour of the younger animal is different; for that of the upper parts is a mixture of brown and pale yellow, while the under parts are nearly white. The opening of the mouth is of great width, and exhibits somewhat of a flexuous outline. Both jaws are furnished with numerous sharp-pointed teeth; those in the middle part of the jaw being largest, and resembling the canine teeth of viviparous quadrupeds. Each jaw contains 30 teeth or more, for the number is found to vary in different individuals, perhaps from the difference of age. The disposition of the teeth is such, that when the mouth is shut, they alternate with each other. When the teeth have been taken out, and the alveoli examined, it has appeared that small teeth were forming beneath, to supply the loss of the others when shed. The external openings of the ears are placed on the top of the head, above the eyes; they are of moderate size, of an oval form, and covered with a membrane, in which there is a longitudinal slit, giving them the appearance of closed eyes. The eyes are furnished with a nictitating membrane, or transparent moveable pellicle, similar to that of birds. The legs of the crocodile are short, strong, and muscular. There are five toes on the fore feet, and they are unwebbed. On the hind feet there are only four toes, which, towards the base, are united by means of a strong membrane. The two anterior toes on each of the fore feet, and the interior one of the hind feet, have no claws; but the other toes are furnished with claws, which are strong, sharp and curved. The tail is long, compressed on the sides, and furnished above with an upright process, formed by the gradual approach of two elevated crests which proceed from the lower part of the back. The upper part of the body of the crocodile is covered with strong armour; which, in its structure exhibits the appearance of a regular and curious carved work, and is indeed a most elaborate piece of mechanism. It is so strong

Lizards. strong and thick, when the animal has reached its full growth, that it easily resists the force of a musket-ball. On the lower parts of the body, it is more pliable, and much thinner, so that it is in these parts only that wounds can be inflicted.

The crocodile deposits its eggs in the sand or mud, in the banks of the rivers which it inhabits; and as soon as the young are hatched, they proceed to the water. When the young are first excluded, the head is proportionally much larger than that of the full grown animal. The egg of the common crocodile is about the size of that of a goose, and resembles greatly that of a bird. It is covered with a calcareous shell, which is lined with a membranous substance. Various birds, the ichneumon and other animals, make great havock among the eggs of the crocodile during the period of hatching, thus diminishing the numbers which would otherwise be produced. The eggs of the crocodile, and indeed the flesh itself, are regarded as delicacies among some African nations, and compose a part of their favourite repasts.

The crocodile is a native of Asia and Africa, but it seems to be more common in the latter than in the former country. It inhabits the large rivers, as the Nile, the Niger, &c. frequenting the low sand islands of these rivers; and preys chiefly on fish, although, being extremely voracious, it seizes any other animal that comes within its reach.

The crocodile has been long regarded as one of the most formidable animals of the countries which it inhabits; but from the accounts of later naturalists, it appears, that it is by no means so ferocious as has been pretended. Denon, who visited Egypt along with the French army, observes, that many stories are related of crocodiles, but that he had not any opportunity of verifying a single one. "Daring, (says he) even to imprudence, our soldiers set them at defiance. Even I myself bathed daily in the Nile; for the tranquil nights that I thus obtained, rendered me regardless of dangers, which we had not as yet verified by a single fact. If the crocodiles had devoured a few of the carcases which the war left at their disposal, such a food, it might be imagined, would only excite their appetite, and engage them to pursue, when alive, so favourite a prey. And yet we were never once attacked by them, nor did we ever meet with a single crocodile at a distance from the water. Hence it appears probable, that they find in the Nile itself a sufficient quantity of easily procurable food, which they digest slowly, being like the lizard and serpent, cold-blooded, and of an inactive stomach. Besides, having in the Egyptian part of the Nile no enemies but each other and man, they would be truly formidable; if, covered as they are, with an almost impenetrable defensive armour, they were alert and skilful in making use of those which nature has given them for attack*."

* *Travels*,
vol. iii.
p. 310.

The same author observes, that no crocodiles were seen at Syene on the river Nile, but that they are to be met with above the cataracts. "They seem (he says) to prefer certain reaches of the river, and particularly from Tentyra to Ombos; they abound most of all near Hermontes. We here saw three of them; one much larger than the rest, was nearly 25 feet long: they were all asleep, so that we could approach them within 20 paces, and we had time to distinguish all the peculiarities

which gave them such a hideous aspect. They resembled dismounted cannon. I fired on one with a heavy musket; the ball struck him, and rebounded from his scales. He made a leap of 10 feet, and dived into the river †."

† *Ibid.* 186.

In the large rivers of Africa, vast shoals of crocodiles are seen swimming together, when they exhibit the appearance of the trunks of large trees floating on the water. It is said that the negroes venture to attack, and often succeed in killing a single crocodile, by stabbing it with a sharp instrument under the belly, where the skin is soft and vulnerable. In some countries, we are told, the hunting of the crocodile with strong dogs, is practised for amusement. For this purpose the dogs are properly trained and instructed; and to protect them against the attack of the crocodile, they are armed with collars furnished with spikes.

It is even said, that crocodiles are occasionally tamed in some parts of Africa, and that they constitute an article of royal magnificence with some of the African monarchs, in which case, they are kept in large ponds or lakes. It is well known that crocodiles were exhibited by the ancient Romans during their public spectacles. In the edileship of Scaurus, he presented the people with a sight of five crocodiles in a temporary lake; and one was introduced by Augustus in his triumph over Cleopatra, for their entertainment.

Var.—A variety of the common crocodile, it is said, has been found in the river Senegal; according to M. Adanson, it has a longer snout, and is almost entirely black. It is said that it is very rapacious, and has only been observed in the above river, where the common crocodiles are very numerous.

2. LACERTA ALLIGATOR, the Alligator or American Crocodile.

Specif. Char.—Head flat, imbricated; neck naked, or uncarinated; tail furnished above with two lateral lines.

The alligator is considered by some naturalists only as a variety of the crocodile; any differences which are observable, they suppose, may be ascribed to the effect of climate. They have the same number of teeth, and their manners and habits are nearly similar in the old and new world; but the difference, although not at first sight obvious, seems to be fully established from the more accurate observations of others. The head of the alligator is smooth, and is not furnished with the rugosities and hard carinated scales which appear on the head of the crocodile; and besides, the snout of the alligator is flatter, wider, and more rounded at the extremity. The size of the alligator is little inferior to that of the crocodile. Individuals have been often seen from 18 to 20 feet long.

Cateby, in his history of Carolina, has given a fuller account of the economy and habits of the alligator, than any other author. "Though the largest, says he, and greatest numbers of alligators, inhabit the torrid zone, the continent abounds with them 10° more north, particularly as far as the river Neus in North Carolina. In the latitude of about 33°, beyond which I have never heard of any, which latitude nearly answers to the northernmost parts of Africa, where they are likewise found, they frequent not only salt rivers near

Lizards.

the sea, but streams of fresh water in the upper parts of the country, and in lakes of salt and fresh water; on the banks of which they lie lurking among reeds, to surprise cattle and other animals. In Jamaica, and many parts of the continent, they are found about 20 feet in length. They cannot be more terrible in their aspect than they are formidable and mischievous in their natures, sparing neither man nor beast they can surprise, pulling them down under water; that being dead, they may with greater facility, and without struggle or resistance, devour them. As quadrupeds do not so often come in their way, they almost subsist on fish; but as providence, for the preservation, or to prevent the extinction of defenceless creatures, hath in many instances restrained the devouring appetites of voracious animals by some impediment or other; so this destructive monster, by the close connection of his vertebrae, can neither swim nor run any way but straight forward, and is consequently disabled from turning with that agility requisite to catch his prey by pursuit; therefore, they do it by surprise in the water, as well as by land; for effecting which, nature seems in some measure to have recompensed their want of agility, by giving them a power of deceiving and catching their prey by a facility peculiar to them, as well as by the outer form and colour of their body, which on land resembles an old dirty log or tree, and in the water frequently lies floating on the surface, and there has the like appearance; by which, and his silent artifice, fish, fowl, turtle, and all other animals are deceived, suddenly caught, and devoured.

Carnivorous animals get their food with more difficulty and less certainty than others; and are often necessitated to fast a long time, which a slow concoction enables them to endure: reptiles particularly, by swallowing what they eat whole, digest slowly, eat seldom, and live long without food. Wolves are said to gorge themselves with mud, to supply the want of better food. For the like cause, many alligators swallow stones and other substances to distend and prevent the contraction of their intestines when empty, and not to help digestion, which they seem in no need of. For in the greater number of many which I have opened, nothing has appeared but lumps of light wood and pieces of pine-tree coal, some of which weighed eight pounds, and were reduced and worn so smooth from their first angular roughness, that they seemed to have remained in them many months. They lay a great number of eggs at one time on the sandy banks of rivers and lakes, which are hatched by the heat of the sun without further care of the parents. The young, as soon as they are disengaged from their shells, betake themselves to the water, and shift for themselves; but while young, they serve as a prey not only to ravenous fish, but to their own species. It is to be admired, that so vast an animal should at first be contained in an egg no better than that of a turkey.

In South Carolina they are very numerous; but the northern situation of that country occasions their being of a smaller size than those nearer the line; and they rarely attack men or cattle, yet are great devourers of hogs. In Carolina they lie torpid from about October to March in caverns and hollows in the banks of rivers; and at their coming out in the spring, make a hideous bellowing noise. The hind part of their belly and tail

are eaten by the Indians. The flesh is delicately white, but has so perfumed a taste and smell, that I never could relish it with pleasure.

Lizards.

The alligators of South America, like the turtles, deposit their eggs at two or three different periods, at the distance of several days, and from 20 to 24 eggs each time. They have been observed to raise a small hillock near the banks of the river; and, after hollowing it out in the middle, to collect a quantity of leaves and other vegetable matters, in which they deposit their eggs. These are covered with the leaves, and are hatched by means of the heat extricated during their putrefaction, along with that of the atmosphere. The alligators about Cayenne deposit their eggs in the month of April."

To the account of the alligator which we have now given, we add the following particulars concerning its natural history by Don Ulloa, in his voyage to South America. The observations were made on the river Guayaquil; and we shall detail them in his own words.

"The increase of fish, says he, in this river is greatly hindered by the prodigious numbers of alligators, an amphibious creature, living both in the rivers and the adjacent plains, though it is not often known to go far from the banks of the river. When tired with fishing, they leave the water to bask themselves in the sun, and then appear more like logs of half-rotten wood thrown ashore by the current, than living creatures; but upon perceiving any vessel near them, they immediately throw themselves into the water. Some are of so monstrous a size as to exceed five yards in length. During the time they lie basking on the shore, they keep their huge mouths wide open, till filled with musquetoos, flies, and other insects, when they suddenly shut their jaws and swallow their prey. Whatever may have been written with regard to the fierceness and rapacity of this animal, I, and all our company know from experience, they avoid a man, and on the approach of any one, immediately plunge into the water. Its whole body is covered with scales impenetrable to a musket ball, unless it happens to hit them in the belly near the fore legs, the only part vulnerable.

"The alligator is an oviparous creature. The female makes a large hole in the sand near the brink of a river, and there deposits her eggs, which are nearly equal to those of an ostrich, and as white as those of a hen, but much more solid. She generally lays about a hundred, continuing in the same place till they are all deposited, which is about a day or two. She then covers them with the sand; and the better to conceal them, rolls herself not only over her precious depositum, but to a considerable distance. After this precaution she returns to the water, till natural instinct informs her, that it is time to deliver her young from their confinement; when she comes to the spot, followed by the male, and tearing up the sand, begins breaking the eggs, but so carefully, that scarce a single one is injured; and a whole swarm of little alligators are seen crawling about. The female then takes them on her neck and back in order to remove them into the water; but the watchful gallinazos make use of this opportunity to deprive her of some; and even the male alligator, which indeed comes for no other end, devours what he can, till the female has reached the water with the few remaining; for all those which either fall from

her

Lizards. back, or do not swim, she herself eats; so that of such a formidable brood, happily not more than four or five escape.

"The gallinazos mentioned in our account of Carthagená, are the most inveterate enemies of the alligators, or rather extremely fond of their eggs, in finding which they make use of uncommon address. These birds often make it their whole business to watch the females during the summer, the season when they lay their eggs, the sands on the sides of the river not being then covered with water. The gallinazo perches in some tree, where it conceals itself among the branches, and there silently watches the female alligator till she has laid her eggs and retires, pleased that she has concealed them beyond discovery. But she is no sooner under the water, than the gallinazo darts down on the repository, and with its beak, claws and wings, tears up the sand, and devours the eggs, leaving only the shells. This banquet would indeed richly reward its long patience, did not a multitude of gallinazos, from all parts join the fortunate discoverer and share in the spoil. I have often been entertained with this stratagem of the gallinazos, in passing from Guayaquil to the custom-house of Babahoyo; and my curiosity once led me to take some of the eggs, which those who frequent this river, particularly the mulattoes, make no difficulty of eating when fresh. Here we must remark the methods used by providence in diminishing the number of these destructive creatures, not only by the gallinazos, but even by the males themselves. Indeed neither the river nor the neighbouring fields would otherwise be sufficient to contain them; for, notwithstanding the ravages of these two insatiable enemies, their numbers can hardly be imagined.

"These alligators are the great destroyers of the fish in this river, it being their most safe and general food; nor are they wanting in address to satisfy their desires, eight or ten, as it were by compact, draw up at the mouth of a river or creek, whilst others of the same corps go a considerable distance up the river, and chase the fish downwards, by which none of any bigness escape them. The alligators, being unable to eat under water, on seizing a fish, raise their heads above the surface, and by degrees draw the fish from their jaws, and chew it for deglutition. After satisfying their appetite, they retire to rest on the banks of the river.

"When they cannot find fish to appease their hunger, they betake themselves to the meadows bordering on the banks of the river, and devour calves and colts; and in order to be more secure in seizing their prey, take the opportunity of the night, that they may surprize them in their sleep; and it is observed that those alligators which have once tasted flesh, become so fond of it, as never to take up with fish but in cases of necessity. There are even too many melancholy instances of their devouring the human species, especially children, who, from the inattention natural to their age, have been without doors after it is dark; and though at no great distance, these voracious animals have dared to attack them, and having once seized them with their mouth, to make sure of their prey against that assistance which the cries of the victim never fail to bring, hasten into the water, where they imme-

diately drown it, and then return to the surface and devour it at leisure.

"Their voracity has also been felt by the boatmen, who, by inconsiderately sleeping with one of their arms or legs hanging over the side of the boat, these animals have seized, and drawn the whole body into the water. Alligators who have once feasted on human flesh are known to be the most dangerous, and become, as it were, inflamed with an insatiable desire of repeating the same delicious repast. The inhabitants of those places where they abound are very industrious in catching and destroying them. Their usual method is by a casonate, or piece of hard wood sharpened at both ends, and baited with the lungs of some animal. This casonate they fasten to a thong, the end of which is secured on the shore. The alligator, on seeing the lungs floating on the waters, snaps at the bait, and thus both points of wood enter his jaws in such a manner, that he can neither shut nor open his mouth. He is then dragged ashore, where he violently endeavours to rescue himself, while the Indians bait him like a bull, knowing that the greatest damage he can do is to throw down such, as for want of care or agility do not keep out of his reach.

"The form of this animal so nearly resembles that of the lagarto or lizard, that here they are commonly called by that name; but there is some difference in the shape of the head, which in this creature is long, and towards the extremity slender, gradually forming a snout, like that of a hog, and, when in the river, is generally above the surface of the water; a sufficient demonstration that the respiration of a purer air is necessary to it. The mandibles of this creature have each a row of very strong and pointed teeth, to which some writers have attributed particular virtues; but all I can say to this is, that they are such as I and my companions, notwithstanding all our enquiries to attain a complete knowledge of every particular, could never hear any satisfactory account of*."

* Vol. i.
200.

3. LACERTA GANGETICA, *Gangetic or Indian Crocodile.*

Specif. Char.—Jaw somewhat cylindrical, elongated; tail furnished above with two crests uniting in one towards the extremity.

In this species the jaws are long, narrow, and straight; and the upper mandible is terminated above by an elevated tubercle. This structure of the snout is more remarkable in the young animal. The teeth of this species are more numerous than in the common crocodile, being nearly double the number, and they are of equal size through the whole length of the jaws. Excepting that the third and fourth toes, both on the fore and hind feet are connected together by a web; the structure of the feet is the same as that of the common one. The eyes are extremely prominent; and it has been observed, are so constructed, that they may be raised above the water, when the rest of the body is under the surface; by which the animal is enabled to see its prey either on the surface of the water, or on the banks of rivers. In the general form and colour of the body and limbs, this species resembles the common crocodile, only the number of transverse bands formed by the rows of scales on the back, is greater.

It

Lizards.

It is a native of India, and is chiefly found in the Ganges, where it is nearly equal in size to the common crocodile.

Lizards.

they dip the flesh of the guana as they eat it. It is remarkable that this fat, which adheres to the inside of abdomen, imbibes the colour of the fruit the animal eats last, which I have frequently seen tinged of a pale red, yellow, or sometimes of a purple colour; which last was from eating the *prunus mariuina*, which fruit at the same time I took out of them. Though they are not amphibious, they are said to keep under water above an hour. When they swim, they use not their feet, but clap them close to their body, and guide themselves with their tails. They swallow all they eat whole; they cannot run fast, their holes being a greater security to them than their heels. They are so impatient of cold, that they rarely appear out of their holes but when the sun shines."

Sect. II. GUANAS.

The animals belonging to this section have the back and tail serrated or carinated.

4. LACERTA IGUANA, Common or Great American Guana.

Specif. Char.—Tail long and round; back serrated; gular crest denticulated.

The guana, which of all the lizard tribe is of the most peculiar form, grows to a considerable size. It is often seen, three, four, and sometimes five feet long. The general colour is green, shaded with brown. The back is strongly serrated; which, as well as the denticulations of the pouch at the throat, gives it a formidable appearance.

The guana is a native of many parts of America, and the West Indies. It is said also that it has been found in some parts of the East Indies. It frequents rocky and woody places, and feeds chiefly on insects and vegetables.

The guana itself is reckoned very nourishing and delicate food. The usual method of taking it, is by casting a noose over its head, and then drawing it from its place; for without making any attempt to escape, it stands with its eyes fixed steadfastly at its discoverer, while at the same time it inflates its throat to a very large size.

Catesby has given a good account of the guana, which we shall detail in his own words. "They are," he says, "of various sizes, from two to five feet in length; their mouths are furnished with exceeding small teeth, but their jaw is armed with a long beak, with which they bite with great strength. They inhabit warm countries only, and are rarely to be met with anywhere north or south of the tropics. Many of the Bahama islands abound with them, where they nestle in hollow rocks and trees. Their eggs have not a hard shell, like those of alligators, but a skin only like those of a turtle, and are esteemed a good food. They lay a great number of eggs at a time in the earth, which are there hatched by the sun's heat. These guanans are a great part of the subsistence of the inhabitants of the Bahama islands, for which purpose they visit many of the remote keys and islands in their sloops to catch them, which they do by dogs trained up for that purpose, which are so dexterous as not often to kill them; which, if they do, they serve only for present spending; if otherwise, they sew up their mouths to prevent their biting, and put them into the hold of their sloop till they have caught a sufficient number; which they either carry alive for sale to Carolina, or salt and barrel up for the use of their families at home. These guanans feed wholly on vegetables and fruit, particularly on a kind of fungus growing at the roots of trees, and on the fruits of the different kinds of anonas. Their flesh is easy of digestion, delicate, and well tasted. They are sometimes roasted, but the more common way is to boil them, taking out the leaves of fat, which are melted and clarified, and put into a calabash or dish, into which

Dr Brown, in his natural history of Jamaica, gives the following particulars of the guana. "Like most of the tribe, he observes, it lives a very considerable time without food, and changes its colour with the weather, or the native moisture of its place of residence. I have kept a grown guana about the house for more than two months: it was very fierce and ill-natured at the beginning; but after some days it grew more tame, and would, at length, pass the greatest part of the day upon the bed or couch, but it went out always at night. I have never observed it to eat any thing, except what imperceptible particles it had lapped up in the air; for it frequently threw out its forked tongue, like the chameleon, as it walked along. The flesh of this creature is liked by many people, and frequently served up in fricasees at their tables; in which state they are often preferred to the best fowls. The guana may be easily tamed while young, and is both an innocent and beautiful creature in that state."

Var. Horned guana. This is considered as a variety of the former. It is nearly the same in size and general proportion; the back is also serrated, and the form of the scales is the same. It wants, however, the gular pouch, and there are in front of the head, between the eyes and nostrils, four pretty large scaly tubercles, behind which there is a bony conical process, which is covered with a single scale.

It is a native of St Domingo, where it is said to be very common.

5. LACERTA AMBOINENSIS, Amboina Guana.

Specif. Char. Variegated, tail long, tail fin radiated, dorsal future dented.

This species, which grows to the length of three feet, and sometimes more, is at once distinguished by the singularity of its appearance, and the beauty of its colours. The head and neck are green, and variegated with white transverse undulations. The back and tail are brown, with a shade of purple. The sides and belly are grayish, or pale brown; the head is tuberculated above; and covered with small roundish scales; the mouth is wide, and the teeth are sharp and numerous.

This species is a native of the East Indies, but is most frequent in the island of Amboina, frequenting the neighbourhood of rivers and other fresh waters. It is often seen on the banks of rising grounds, and on low shrubs which grow near the water. It does not ascend tall trees. Whenever it is disturbed by the approach

Lizards.

proach of men or any animal, it plunges into the water, and conceals itself beneath the rocks or stones under the banks. It may be easily taken, as it does not attempt to bite or defend itself, but seems in some measure stupefied.

This species, like others of the tribe, deposits its eggs in the sand, on the banks of the rivers which it frequents. The eggs in the body of the animal are disposed in two long groups or clusters, and are of a yellow colour; but when they are excluded, they are white, and of an oblong shape. The Amboina guana is reckoned a more delicate food than the common one; its flesh is said to be white, sweet, and of a penetrating odour.

6. LACERTA BASILISCUS, *Basilisk*.

Specif. Char.—Tail long; dorsal and caudal fins radiated; occipital crest pointed.

The basilisk is about one foot and a half in length, of a pale ash-brown colour, with some darker variegations about the upper part of the body. In the young animal, the dorsal or caudal process, and the pointed occipital crest mentioned in the specific description, are less distinct.

The basilisk is chiefly a native of South America. It resides principally among trees, and feeds on insects.

It is said to be a very active animal, and by means of its dorsal crest or fin, it is enabled to spring from tree to tree. It can also swim with great ease.

This animal has a very formidable appearance, but is quite harmless; but in the poetical descriptions of the ancients, we find that it was considered to be the most malignant of all poisonous animals; even its look was regarded as fatal. The terrific glance of the basilisk in the African deserts, according to the poetical representation of Lucan, obliged the rest of the poisonous tribe to keep at a distance.

7. LACERTA CALOTES, *Galeot Lizard*.

Specif. Char.—Tail long and round; back dentated on the fore part, and the head on the hind part.

This species seldom exceeds a foot and a half in length, from the tip of the nose to the extremity of the tail; but otherwise in its general habit and appearance, it resembles the common guana. It wants, however, the gular pouch; in its place there is only a slight enlargement of the throat. The colour, which occasionally varies, is most commonly of an elegant bright blue, variegated with broad, irregular, white, transverse bands on each side of the body and tail. The limbs are slender, and this is particularly the case with the toes.

This species is a native of the warmer regions of Africa, Asia, and many of the Indian islands. It is very common in Ceylon. It is said also to be a native of Spain, where it wanders about the tops of houses, in search of spiders. According to some, it preys on rats, and, like some other lizards, attacks small serpents.

8. LACERTA AGAMA, *American Galeot*.

Specif. Char.—Tail long, round; neck above, and head behind, aculeated; scales of the hind head reversed.

Lizards.

This species in some respects resembles the calotes; but it wants the strong serratures on the back, in place of which it has only a small denticulated carina. The head is proportionally larger, and on the back part is furnished with sharp-pointed scales, some of which are reversed at their extremities. The colour is brownish, and variously clouded. In the male, the crest on the back is composed of longer spines, and extends to the lower part.

It is a native of South America, and some of the islands of the West Indies.

Var. *Lacerta Muricata*, *Muricated Lizard*. Tail long, round; body grayish; scales carinated and sharp-pointed.

This lizard, which is considered as a variety of the preceding, measures more than a foot in length, and has even been sometimes found to exceed that size. The want of the reverse scales on the back part of the head, constitutes the principal difference between this and the former species.

It is a native of New South Wales.

9. LACERTA BICARINATA, *Bicarinated Lizard*.

Specif. Char.—Tail of moderate length; four rows of strong carinated scales on the back.

In its general habit, this species bears some resemblance to a small crocodile, on account of the hard tuberculated and carinated scales on the upper parts of the body, two rows of which are more prominent than the rest, and extend from the upper part of the back to the tail, where they coalesce and form a serrated crest to the extremity.

The head is small, the mouth wide, and the snout somewhat sharp. The colour is reddish-brown, tinged in some parts with various shades of green.

It is a native of South America, where it is sometimes used as food. The eggs, it is said, are also greatly esteemed for the same purpose. Woody and marshy regions are the usual places of its resort. One of this species which was kept alive for some time by M. de la Borde, was observed to remain for hours together in the water, and when it was disturbed or alarmed, it concealed itself, but delighted to come out occasionally and bask in the sun.

Var. A lizard known by the name of *ignaruca*, and said to be a native of Brazil, is considered as a variety of the preceding, differing only in the colour, which is darker, and the claws which are shorter; but, like it, it has some resemblance to the crocodile, and readily climbs trees.

10. LACERTA MONITOR, *Monitory Lizard*.

Specif. Char.—Colour black; tail very long, compressed, carinated; body marked with transverse rows of white, ocellated.

This is one of the largest of the whole tribe of lizards. From the tip of the nose to the extremity of the tail, it sometimes measures no less than four or five feet. It is also one of the most beautiful. The head is small, the snout gradually tapers, the limbs are slender, and the tail which is laterally compressed, gradually decreases towards the extremity. Indeed the shape altogether is slender and elegant, and although the colours are simple, they

Lizards. they are so disposed as to produce an agreeable and pleasing effect. This species is a native of South America, inhabiting woody and marshy places.

It is said that the monitory lizard from the gentleness of its disposition, is remarkable for its attachment to mankind, warning them of their danger from the alligator by emitting a peculiar and shrill sound.

Var. *Lacerta Varia*, Variegated Lizard.—Although this lizard is somewhat different in colour, and in the disposition of its variegations, which are rather of a pale yellow than white, yet it is considered only as a variety of the preceding. It is a native of New Holland.

11. LACERTA ACANTHURA, *Spine-tailed Lizard*.

Specif. Char.—Throat plaited beneath; body covered with minute scales; tail long and verticillated with carinated triple-spined scales.

The length of this species is about a foot and a half. The head is covered with scales, which are small and nearly six-sided; it is quite distinct from the body. The whole skin about the neck, throat, and beginning of the sides, is quite loose, which in the specimen described, may have had a pouched appearance. All the other parts of the body are covered with very small scales. The tail is very long, and strongly marked into numerous rings, which are composed of long and strongly carinated scales, each of which terminates in a lengthened point, and produces the spiny appearance. There are five long toes on each foot; the claws are strong and sharp. The colour on the upper parts of the body is glaucous, variegated with small whitish clouds and marblings.

It is described by Dr Shaw from a specimen in the British Museum.

12. LACERTA LOPHURA, *Sharp-tailed Lizard*.

Specif. Char.—Body covered with dissimilar scales; back serrated; tail long, and somewhat compressed.

This is a very large species; there are large, rounded, and oval scales scattered here and there among the smaller ones. The tail is long and sharp-pointed; the back and tail are serrated throughout their whole length.

This species is also described by Dr Shaw from a specimen in the British Museum.

13. LACERTA DRACÆNA, *Dracæna Lizard*.

Specif. Char.—Large tail; long and denticulated along the upper part.

This is one of the largest species belonging to the tribe. Not only in the size of the body, but in the proportion of the limbs and tail, it exceeds that of the guana. The colour is brown, with a slight shade of chestnut. On the out sides of the limbs there are numerous small pale yellowish spots. The head is small, and the snout tapering.

It is a native of South America, and some of the Indian islands; and it is said that in some countries it is preferred as an article of food to the guana.

14. LACERTA SUPERCILIOSA, *Supercilious Lizard*.

Specif. Char.—Tail carinated; back and eyebrows ciliated, with upright lanceolated scales.

The general appearance of this species bears some resemblance to the guana, and still more to the horned guana, in having the appearance of a pair of sharp pointed horn-like processes above and beyond each eye; between these are placed some aculeated scales. The size of one which has been described, measures from 12 to 16 inches, from the tip of the nose to the extremity of the tail.

It is a native of Asia, and of some of the Indian islands.

15. LACERTA SCUTATA, *Scutated Lizard*.

Specif. Char.—Tail of moderate length, compressed; dorsal future dented; two pointed processes on the back of the head.

This species is distinguished from the former by having a proportionally larger head, and a row of scales more elevated than the rest, passing over each eye; and from these a ridge is continued towards the back of the head, where they unite and extend down the middle of the back, in form of a short denticulated crest, to the beginning of the tail. The body is covered with acuminate scales which are but small; the limbs and tail with larger ones.

It is a native of the island of Ceylon.

16. LACERTA PRINCIPALIS, *Smooth Crested Lizard*.

Specif. Char.—Tail subcarinated; gular crest plain edge; back smooth.

This species is in general of a slender form, and small, rarely exceeding eight or nine inches in length, including both the body and tail. The colour is blue, the head small, and the snout taper.

It is a native of South America.

Var. *Lacerta bimaculata*, Linn.

This is considered as a variety of the former; the colour is blue, spotted here and there with black, with two larger black spots over the shoulders.

It is a native of St Eustatia, and is found also in Pennsylvania.

Var. *Le Roquet*, of Cope, is considered by Dr Shaw also as a variety of the smooth-crested lizard, as it resembles it both in size and habit; it is however destitute of the gular crest.

It frequents gardens, moving nimbly among trees, and devours great multitudes of smaller insects.

17. LACERTA STRUMOSA, *Strumous Lizard*.

Specif. Char.—Tail long, round; breast gibbose, projecting.

This is of a small size, has no dorsal serratures, but is furnished with a large flat gular crest, of a pale red colour; the rest of the animal is of a pale bluish gray, with some slight shades of a more dusky hue. The limbs are slender.

It is a native of South America.

18. LACERTA MARMORATA, *Marbled Lizard*.

Specif. Char.—Tail long, round; throat subcrested, back smooth.

This species is of a slender and elegant form, and measures, including the tail, about a foot in length.

The

Lizards.

The head is small, the snout taper. The colour is pale blue, variegated with undulating transverse bands of a whitish shade. The belly is of a pale rose colour. It is a native of America and the West Indies.

19. LACERTA UMBRA, *Umber Lizard*.

Specif. Char.—Tail long, round; neck subcrested above; hind head callous; back striated.

This is a small species; the body is covered with scales, which are carinated and pointed; the head is obtuse, and marked on the hind part with a large callous bare spot.

It is a native of North America.

Sect. III. CORDYLES.

Having denticulated or spiny scales on the body or tail, or both.

20. LACERTA PELLUMA, *Pelluma Lizard*.

Specif. Char.—Tail long, and verticillated with rhomboidal scales.

This lizard is about two feet in its total length, and is distinguished on the upper parts of its body by a beautiful variety of green, yellow, blue, and black colours. The under parts of the body are of a glossy yellowish green.

It is a native of Chili.

21. LACERTA AZUREA, *Azure Lizard*.

Specif. Char.—Tail short, verticillated with mucronated scales.

This is of a fine blue colour, transversely banded with black or blue. It is sometimes only a few inches long, but others are found of a larger size.

The larger variety is a native of South America, the smaller of some parts of Africa.

22. LACERTA CORDYLUS, *Cordyle Lizard*.

Specif. Char.—Body smooth; tail short and verticillated with denticulated scales.

This species, at first sight, bears a considerable resemblance to the former; but the scales which cover the body are of an oblong-square form, and larger, and the tail is verticillated with rows of large scales of the same form. The colour is sometimes blue, sometimes a livid brown, and the total length is about ten inches.

23. LACERTA STELLIO, *Rough Lizard*.

Specif. Char.—Tail verticillated, with denticulated scales; body and head mucronated.

The whole upper surface of the body is remarkably rough, from being covered with projecting pointed scales. It is of a pale bluish brown colour, with some deeper and lighter transverse variegations. It is about eight inches long.

This species is a native of many parts of Africa.

VOL. VIII. Part I.

Lizards.

24. LACERTA ANGULATA, *Angulated Lizard*.

Specif. Char.—Tail long, hexagonal, and furnished with carinated and mucronated scales.

This is a small species of a brown colour. Beneath the throat there are two large rounded scales. The tail is longer than the body, and strongly marked with six longitudinal ridges.

It is a native of America.

25. LACERTA ORBICULARIS, *Orbicular Lizard*.

Specif. Char.—Body brown, round; tail short, round; scales mucronated.

The colour of this species is dusky brown, variegated with different shades; the body is large and ventricose, and in this respect it resembles the toad.

This is a native of South America, but is a rare species.

Sect. IV. LIZARDS PROPER.

The surface of the body is smooth, and they are generally furnished with broad square plates or scales on the abdomen.

26. LACERTA AGILIS, *Green Lizard*.

Specif. Char.—Of a green colour, with minute dusky variegations. There is a collar of large scales beneath the neck; tail long, verticillated.

The length of this species is from 10 to 15 inches; but it sometimes arrives at such a size as to measure more than two feet to the end of the tail. The colour consists of a mixture of different shades of green, with spots of yellow, brown, black, and sometimes red. The head is covered with angular scales, and the rest of the upper parts of the body with small ovate ones. The tail is longer than the body, and is marked with numerous rings of oblong square scales.

This species is a native of all the warmer parts of Europe. It is found in gardens about warm walls, buildings, &c. It is a very active animal, and pursues its prey, which consists of insects, with great celerity. When it is caught, it soon becomes familiar, and may even in some measure be tamed.

Var. The gray lizard, or little brown lizard, which is also a native of many parts of Europe, is considered as a variety of the former. It is about six or eight inches long, of a greenish brown, or pale grayish colour.

This variety is a native of Britain, and is found on the sides of dry banks, or sand hills, where it is occasionally seen basking during the heat of summer. It is also found about the roots of trees, old walls, &c.

27. LACERTA TEGUIXIN, *Variegated Lizard*.

Specif. Char.—Tail long, round; sides somewhat wrinkled; plate under the throat triple.

This species is sometimes larger than the guana. The head is covered with large scales or plates, and the body with smaller and square scales. The colour is extremely beautiful; it consists of an elegant variegation

Lizards. tion of black, brown, and purple spots, on a pale bluish, white, and yellowish ground.
It is a native of South America.

28. LACERTA ERYTHROCEPHALA, *Red-headed Lizard*.

Specif. Char.—Colour blackish green, undulations transverse and black; abdomen longitudinally banded with black, white, and blue; breast black; top of the head red.

This species is of a moderate size; the scales on the head are largest, and there is a row of tubercles beneath the thighs.

It is a native of the island of St Christopher.

29. LACERTA CERULEA, *Ameiva Lizard*.

Specif. Char.—Colour blue, with black and white variegations; tail long, verticillated; abdominal scuta 30.

The ameiva greatly resembles the green lizard, but it wants the scaly collar. The scales on the upper part of the body are not distinctly visible; those of the abdomen are composed of square plates, and there is a row of tubercles beneath each thigh.

It is a native of South America, and it is said that it is sometimes found in Africa and Asia.

30. LACERTA LEMNISCATA, *Striped Lizard*.

Specif. Char.—Colour dusky blue; eight white lines down the back; limbs spotted with white; tail long, round.

This is of a smaller size than the last species, but in its general appearance bears a considerable resemblance. The white stripes on the back vary in breadth, and sometimes in number.

It is a native of Guinea, but is also found in some parts of India and South America.

31. LACERTA QUADRILINEATA, *Four-striped Lizard*.

Specif. Char.—Colour blackish blue; four white or yellowish lines down the back; tail long, round; fore feet tetradactylous.

This is a smaller species than the last, but resembles it greatly. The claws are very small.

It is supposed to be a native of North America.

32. LACERTA TENIOLATA, *Riband Lizard*.

Specif. Char.—Body marked above with black and white stripes; beneath white; tail long and round.

This is a small species; the colour above is chestnut brown, and the scales on every part of the body are smooth, round, and imbricated. From the head to the middle of the tail there are six white linear stripes. The limbs are striped longitudinally with black.

It is a native of New Holland.

33. LACERTA SEXLINEATA, *Six-lined Lizard*.

Specif. Char.—Colour gray brown; six white lines down the back; tail long, verticillated.

This is a small species. Beneath the throat there is

a double plate, and a row of tubercles beneath the thighs. The legs are long and the feet slender; the tail is carried curved over the back, from which it has been called the lion lizard.

It is a native of the West Indies, where it frequents the rocks on the sea coast.

34. LACERTA FASCIATA, *Fasciated Lizard*.

Specif. Char.—Colour of the body brown; tail blue and rather long. There are five yellowish lines down the back.

This is a small species, rarely exceeding eight inches in its whole length. The head is short.

It is a native of Carolina, inhabiting hollow trees.

35. LACERTA QUINQUELINEATA, *Five-lined Lizard*.

Specif. Char.—Colour dusky; five whitish lines down the back; tail round, and of a moderate length.

This is a small species. The tail is twice the length of the body. There are six stripes on the head. The abdomen is imbricated with striæ.

It is a native of Carolina.

36. LACERTA INTERPUNCTATA, *Punctated Lizard*.

Specif. Char.—Tail long, round; dorsal lines two, and yellow, having black specks interspersed.

This is a small species; the body is smooth and glossy, and the head is covered with large scales.

It is a native of Asia.

37. LACERTA BULLARIS, *Red-throated Lizard*.

Specif. Char.—Colour green; gular pouch red; tail long, round.

This species is about six inches long, of a shining grass-green colour. When it is approached, the throat swells into a globular form, and the protruded skin becomes of a bright red colour. This is supposed to be a threatening aspect, but probably without foundation.

This species is a native of Jamaica, where it is common about hedges and trees.

Var. Green Carolina lizard.—This resembles the former in every respect, except in the appearance of the gular pouch. In dry hot weather it appears of a bright green colour; but in cold weather this changes to a brown.

It is a native of Carolina, where it is very common about houses.

38. LACERTA CRUENTA, *Red-tailed Lizard*.

Specif. Char.—Colour brown; on the neck there are seven white stripes, and four on the back. Under the throat there is a plate; the tail is verticillated and red beneath.

This is a very small species, resembling the *lacerta velox*, but differs from it in having a sharper snout. The limbs are marked with white round spots; the tail is red beneath and white at the tip. There is a row of tubercles on the thighs.

It is a native of the southern parts of Siberia, and is found about the salt lakes.

Lizards. 39. LACERTA LOBATA, *Lobe-cheeked Lizard*. *Lacerta Aurata*, Linn.

Specif. Char.—Colour brownish, with a roundish denticulated lobe on each side of the neck.

This species is of moderate size, and in appearance is somewhat thick or ventricose. Body rather depressed; the head rounded on each side. From the corner of the mouth extending to the shoulders, there is a flat femi-orbicular lobe of a red colour, with serrated edges. The whole of the body is rough, with small pointed granules.

It is a native of the southern deserts of Siberia, and is found among the sand hills.

40. LACERTA HELIOSCOPA, *Sun-gazing Lizard*.

Specif. Char.—Colour brownish; head rough, with calli; a transverse plate beneath the throat; tail imbricated, thick at the base, and sharp at the tip.

This is a small species, scarcely exceeding a finger's length. The colour of the upper parts of the body is gray, with brown and bluish spots and linear streaks. The neck is often marked above with a red spot. The tip of the tail is red beneath.

It is a native of the southern parts of Siberia, where it basks in sunny situations, with its head turned up towards the sun.

41. LACERTA TURCICA, *Turkish Lizard*.

Specif. Char.—Colour brown; body roughish; tail of moderate length, and somewhat verticillated.

This is a small species; the head is rather large, and the body thickish; the tail short, thick at the base, and pointed at the tip.

It is a native of eastern countries.

42. LACERTA PLATURA, *Broad-tailed Lizard*.

Specif. Char.—Colour gray brown, paler beneath; body rough; tail depressed, lanceolated, and spiny on the margin.

This species is from four to six inches long, and is remarkably distinguished by the singular form of its tail. The feet are pentadactylous; the toes slender, and the claws curved.

It is a native of New Holland.

43. LACERTA PLICA, *Plica Lizard*.

Specif. Char.—Hind head callous; eyebrows excoriated above; neck plated beneath, and warted at the sides; tail long and round.

This is a small species, not exceeding a finger's length. It is entirely covered with conical scales; there is a double plate beneath the throat.

It is a native of South America and India.

44. LACERTA JAPONICA, *Japanese Lizard*.

Specif. Char.—Tail long, round; feet unguiculated; fore feet tetradactylous; a single stripe on the back.

This is a small species; the colour above is livid brown, and the yellow stripe from the hind head to the

beginning of the tail is broad and dentated. The claws are black. Lizards.

45. LACERTA NILOTICA, *Nilotic Lizard*.

Specif. Char.—Tail long and triquetrous; body smooth, with four lines of scales down the back.

This likewise is a small species. It is a native of Egypt.

46. LACERTA TILIGUERTA, *Tiliguerta Lizard*.

Specif. Char.—Tail verticillated, twice the length of the body, and having eighty abdominal scuta.

This, like the former, is a small species, measuring not more than seven or eight inches long. The female is of a brown, and the male of a green, colour, with black spots. It seems to bear some relation to the green lizard.

It is a native of Sardinia, where it is to be met with in fields, about walls, &c.

47. LACERTA DESERTI, *Desert Lizard*.

Specif. Char.—Tail round, longish; feet pentadactylous; body black above, and marked with six longitudinal white lines.

This is a very small species; the body is white beneath, and the stripes on the back are composed of oblong spots.

It is a native of the Uralian desert.

48. LACERTA ARGUTA, *Argute Lizard*.

Specif. Char.—Tail short, verticillated; thick at the base and filiform at the tip; collar marked with obscure scales. There is a remarkable double plate under the neck.

This species is somewhat similar to the green lizard, but is shorter and more ventricose, and has a sharper snout.

It is a native of the south of Siberia.

49. LACERTA ALGIRA, *Algerine Lizard*.

Specif. Char.—Tail long, verticillated; two yellow lines on each side of the body.

This species is about a finger's length, brown above, and yellowish beneath.

It is a native of Algiers.

50. LACERTA VELOX, *Swift Lizard*.

Specif. Char.—Tail longish, verticillated; scaly collar beneath the neck; body cinereous, with five longitudinal paler bands, variegated with black specks; the sides spotted with black, and speckled with blue.

This species is much smaller and more slender, but in other respects comes very near to the *lacerta agilis*. The hind feet are marked with orbicular spots.

It is a native of Siberia.

51. LACERTA URALENSIS, *Ural Lizard*.

Specif. Char.—The tail is long and round; the neck plated

plated beneath; the feet are pentadactylous, and the back is livid, rugose, and subverrucose.

The length of this animal is about four inches; the head is roundish; the colour of the upper parts is livid brown, and the skin is wrinkled and slightly tuberculated.

It is a native of the desert of Ural, and moves about with great swiftness.

52. LACERTA SEPS, *Seps Lizard*.

Specif. Char.—Colour bluish brown; tail longish, verticillated; lateral future reflexed; scales square.

This is a small species, and is easily known from the thin lengthened form of its body, and long slender tail, as well as from the square scales with which it is entirely covered. The tail is marked with about 50 divisions.

It is a native of the southern parts of Europe.

SECT. V. CHAMELEONS.

These are distinguished by having a granulated skin, a large head, a long missile tongue and cylindrical tail.

53. LACERTA CHAMÆLEON, *Common Chameleon*.

Specif. Char.—Crown flat; tail cylindrical and incurvated; toes united by two and three.

The length of the chameleon, from the tip of the nose to the beginning of the tail, is about ten inches. The tail is nearly of the same length. The skin on every part of the animal is granulated. A series of obscure denticulations runs down the back, and forms a ridge on that part. There are five toes on each foot, two and three of which are united by a common skin, as far as the claws; the two outward and three inward toes of the fore feet are united, and the two inward and three outward of the hind feet. The structure of the tongue of the chameleon is very peculiar; it is very long, and furnished with a dilated somewhat tubular tip, by which means it is enabled easily to seize insects, which are its prey, by darting it out and securing them on the tip.

The chameleon, like others of the amphibia, has the power of inflating its lungs, and retaining the air for a long time. It is in this way that it sometimes appears plump and fleshy, while at other times, when the air is ejected, and the lungs in a collapsed state, it exhibits nothing but skin and bone. The natural colour of the skin of the chameleon is of a bluish ash, and the usual changes are from this to a green or yellowish colour, spotted unequally with red. When the animal is exposed to full sunshine, the darkened side appears in a few minutes of a pale yellow, with large roundish spots of red brown; but when the animal is turned round, the reverse takes place. The side formerly in the shade appears of a brown or ash colour, and the other side yellow and red. These changes, however, vary greatly, both with regard to the disposition of the spots and the intensity of the colours.

The chameleon is a native of Europe, Africa, and Asia. It is indeed chiefly found in tropical regions;

but it is also sometimes met with in the warmer parts of Spain and Portugal.

No animal has been more celebrated than the chameleon, and particularly on account of the power which it was supposed to possess of changing its colour. This account was greatly exaggerated when it was asserted, that it could produce this change at pleasure, and assimilate it to that of any particular object. But the more accurate observations of modern naturalists have shewn, that this change of colour varies greatly, and seems to depend on the state of the animal's health, the temperature of the weather, and probably some other unknown causes. Another erroneous assertion with regard to the chameleon was, that it could live entirely on air. This no doubt arose from the long abstinence which this animal, as well as many others belonging the class *amphibia*, can endure.

54. LACERTA AFRICANA, *African Chameleon*.

Specif. Char.—Colour blackish; crown carinated.

This is one of the largest yet discovered. Along the back to the end of the tail there runs a pure white stripe, bounded by a broad blackish band. The other parts of the animal are variegated with pale ash-coloured undulations.

It is supposed to be a native of Barbary.

55. LACERTA PUMILA, *Little Chameleon*.

Specif. Char.—Body bluish on each side, and marked with two yellowish lines.

The head of this species is somewhat flatter than the former, but still elevated in the middle, and edged on each side with a denticulated margin.

By some the two latter seem to be considered only as varieties.

SECT. VI. GECKOS.

In the animals of this division the skin is granulated or tuberculated; the feet are lobated, and the toes lamellated beneath.

56. LACERTA GECKO, *Common Gecko*.

Specif. Char.—Livid, with brown variegations; upper part of the body warted, and the lamellæ of the feet not divided.

This animal is said to have received the name of *gecko* from the peculiar sound of its voice, which bears some resemblance to that word when uttered in a shrill tone. Its length, in general, is about a foot or more, and therefore it ranks among the middle-sized animals of the lizard tribe. Its form is thicker and stronger than the greater part of lizards. Its head is flattish, somewhat triangular and large, with a covering of minute scales; its mouth is wide, eyes large, teeth small, and its tongue is broad and flat. The limbs of this animal are moderately long, with broader feet than the rest of the tribe; the toes are dilated on the margins, and beneath are divided into a number of transverse lamellæ parallel to each other, without any longitudinal furrow. The general colour of the gecko is a pale brown,

Lizards. brown, with some irregular dusky or bluish variegations; but this colour becomes much more brilliant in warmer regions.

It is a native of Asia and Africa, and some of the warmer parts of Europe, inhabiting obscure recesses, caverns, old walls, &c. It has been supposed to be of a poisonous nature. A fluid exudes from the lamellæ of the feet, which is said to be extremely acrid; and when any of it has remained on fruit, when it is eaten, it is said that it produces troublesome symptoms. The peculiar structure of the feet enables the animal to attach itself to the smoothest surfaces.

Var. *Tokai*.—This, which is considered as a variety of the former, is about a foot long. The body is covered above with a granulated skin, varied with red and blue undulations; the belly is ash colour, and interspersed with red spots; the head is large and triangular.

This is a native of Siam, where it occasionally enters the houses, and is considered as a poisonous animal.

The Indian salamander, described by Bontius, seems to be of the same kind; the length is about a foot; the colour sea-green, spotted with red; the head large, and like that of a toad; the body is broad and the tail long.

It is a native of Java. It is said that the inhabitants hold up the animal by the tail to make it discharge saliva from its mouth, which is collected for the purpose of poisoning their arrows.

57. LACERTA DUBIA, *Geckotte*.

Specif. Char.—Livid colour; upper surface covered with pointed warts; no femoral papillæ.

This species bears some resemblance to the gecko; but differs from it in being thicker and shorter, and in wanting the papillæ under the thighs. The tail in the young animal is divided into strongly marked aculeated rings. These become gradually less conspicuous with the age of the animal, and are at last totally obliterated.

It is a native of the south of France, where it is known by the name of *tarente*, and is regarded as an innocent animal. It frequents ruins, walls, houses; delights greatly in sunshine, and avoids damp shady situations. It remains concealed in the hollows of walls during winter, not, however, in a torpid, but in an inert state.

58. LACERTA PERFOLIATA, *Perfoliated Gecko*.

Specif. Char.—Colour brownish, smooth above; lamellæ of the feet divided by a furrow; tail frequently turbinated.

This species is of a thicker form, has shorter limbs, and the tubercles on the back are less distinct than the common gecko. It is also different in wanting the papillæ under the thighs. The tail is remarkably swelled immediately beyond its origin, and then tapers to the extremity, somewhat resembling a young turnip root, from whence it has been denominated *lacerta rapi-cauda*.

Its native country is not mentioned.

59. LACERTA MAURITANICA, *Mauritanic Gecko*.

Lizards.

Specif. Char.—Colour brown, covered above with sharp warts; tail flat, and furnished with scuta beneath; lamellæ of the feet lunulated and divided.

This species resembles the common one, but is different from being covered with spiny or sharp-pointed warts on the upper surface. The toes are lamellated beneath, but are not divided by a middle sulcus.

60. LACERTA SINENSIS, *Chinese Gecko*.

Specif. Char.—Tail flat, all the toes unguiculated; face perforated with several pores.

The head is broad and flat; the teeth small; the tongue flat, and emarginated at the tip. About the sides of the nose and eyes there are several scattered pores.

It is a native of China, and is frequently seen in houses, running about the walls, and climbing readily on the smoothest surfaces. It preys chiefly on the smaller kind of cock-roach. It is considered as an innocent animal.

61. LACERTA VITTATA, *White-striped Gecko*.

Specif. Char.—Colour yellowish brown, with a white dorsal band, which is forked over the head.

This is a small species, not exceeding seven or eight inches in length; the head is large in proportion to the body; the toes are lamellated beneath, divided by a sulcus, and terminated by curved claws. The upper surface is covered with extremely small tubercles: they are so minute as to be scarcely perceptible.

This species is said to be a native of India.

62. LACERTA FIMBRIATA, *Fimbriated Gecko*.

Specif. Char.—A membranaceous fimbriated border on each side of the body; tail flat; lamellæ of the feet divided by a furrow.

This is a very remarkable species, which, as the count de Ceppe, who describes it, observes, seems in some degree to connect the chameleon, the gecko, and the water-newts. The largest individual which he examined measured about eight inches and a half in length. The head is large and flattened, and its outline seen from above is nearly triangular, as in the chameleon; but the triangle is of a longer form, and there is no rising crest. The most remarkable part of its structure is the fringed process which commences on each side of the head, and is continued along the sides of the body. The colour of this animal varies as in the chameleon, exhibiting different shades of red, yellow, green, and blue.

It is a native of Madagascar, where it is pretty common. It is a harmless animal, and yet is regarded with great abhorrence by the natives, who consider it as of a poisonous nature, and run from it with great precipitation. This popular prejudice is supposed to have arisen from a peculiar habit of the animal, of running with open mouth towards the spectator, instead of making its escape when it is discovered. It appears chiefly in rainy weather, moving about with great agility, and springing

Lizards. ing from one branch of a tree to another in search of insects, which are its proper food.

63. LACERTA TETRADACTYLA, *Four-toed Gecko*.

Specif. Char.—Colour yellow, varied with green; tail flat; feet tetradactylous.

This species is about 12 inches long, and is nearly allied to the preceding species, except that it wants the fimbriated margin, and the number of the toes on the fore feet being only four.

It is also a native of Madagascar, and is not held in less abhorrence by the inhabitants than the former. It lives in the woods, appearing in the rainy season during the night.

64. LACERTA CAUDIVERBERA, *Scollop-tailed Gecko*.

Specif. Char.—Tail flat, pinnatifid; feet palmated.

This species, which is a very singular one, is about 16 inches long, and of this the tail measures above one half. The head is large and flat, the body thick, and the limbs short. The fore feet are like the rest of the species, but the hind feet are strongly palmated. The tail tapers gradually to the tip, but through its whole length is edged with a broad deep scolloped fin: this gradually widens towards the tip, and is considerably broader than on the sides. The back is marked with numerous distant red tubercles, each of which is surrounded by a circle of small white scales. The webs of the hind feet, and the finny part of the tail, are of a bright red.

This species is said to be a native of Arabia; but being a very rare animal, its natural history is not well known.

65. LACERTA SCHNEIDERIANA, *Schneiderian Gecko*.

Specif. Char.—Colour gray; tail convex above and flat below; a black band on each side of the head; lamellæ of the feet lunulated and divided.

The colour of this species is cinereous, with a brown band on each side of the head; on each side of the body there is a future or wrinkling of the skin; the tail is edged with a row of sharper and longer scales than on the other parts.

66. LACERTA SPARMANNIANA, *Sparmannian Gecko*.

Specif. Char.—Body papillated above; tail lanceolated; fore feet tetradactylous.

This is a small species, measuring not more than three inches in total length. The colour on the upper part of the body is variegated with darker and lighter shades; on the under part it is whitish.

It is a native of the Cape of Good Hope, where it is regarded as a poisonous animal. It is said that the fluid secreted from its pores, as well as the saliva, produces inflammatory tumors, and sometimes even gangrenes.

67. LACERTA SPULATOR, *Spitting Gecko*.

Specif. Char.—Colour gray, marked above with brown transverse bands; tail round, furnished with scuta beneath.

The total length of this species does not exceed four inches, and sometimes it is smaller. The scales on the whole animal are smooth and glossy.

It is a native of the island of Eustatia, where it is found about houses, walls, &c. When it is alarmed, it is said to eject from its mouth a black acrid fluid, which occasions slight inflammation of the skin, and is usually removed by rubbing the part with camphorated spirit of wine.

Sect. VII. SCINKS.

The animals of this division are covered with rounded fish-like scales.

68. LACERTA SCINCUS, *Official Scink*.

Specif. Char.—Colour a yellowish brown, with transverse brown bands on the upper part of the body; tail short, compressed at the tip; upper jaw longest.

The scink is from six to seven inches long, and sometimes more. The head is rather small, the body thick and round, and the tail in general shorter than the body. The surface of the body has a glossy appearance.

This species is a native of many of the eastern countries. It is very common in Libya, Syria, Egypt, and Arabia, frequenting dry and sandy soils. It was once in considerable estimation as a medicine, in leprosy and similar diseases.

This animal is described under the name of *el adda*, by Mr Bruce, and is represented as very common in the province of Atbara in Abyssinia. "It burrows, says he, in the sand, and performs this operation so quickly, that it is out of sight in an instant, and appears rather to have found a hole than to have made one; yet it comes out often in the heat of the day and basks itself in the sun, and, if not very much frightened, will take refuge behind stones, or in the withered ragged roots of the abinthium, dried in the sun to nearly its own colour. Its length is rather more than six inches; though its legs are long it does not make use of them to stand upright, but creeps with its belly almost close to the ground. It runs, however, with very great celerity. It is very long from its shoulder to its nose, being nearly two inches: its body is round, having scarce any flatness in its belly; its tail, too, is perfectly round, having no flatness in its lower part; it is exceedingly sharp-pointed, and very easily broken. Yet I have seen several, where the part broken off has been renewed, so as scarcely to be discernible. It is the same length between the point of the tail and the joint of the hinder leg, as was between the nose and the shoulder of the fore leg; its forehead from the occiput is flat; its shape conical, not pointed, but rounded at the end, in shape of some shovels or spades: the head is darker than the body, the occiput darker still. Its face is covered with fine black lines, which cross one another at right angles like a net; its eyes are small, defended with a number of strong black hairs, or eyelashes. Its upper jaw is longer, and projects considerably over the under. Both its jaws have a number of short, fine, but very feeble teeth; and when holding it in my hand, though it struggled violently to get loose, it never attempted to make use of its teeth: indeed it seems to

turn

Lizards. turn its neck with great difficulty. Its ears are large, open, and nearly round. Its body is a light yellow, bordering on straw colour, crossed with eight bands of black, almost equally distant, except the two next the tail. All these decrease both in breadth and length, from the middle towards each extremity of the animal. The scales are largest along the back. They are very close, though the divisions are sufficiently apparent. Their surface is very polished, and seems as if varnished over. Its legs, from the shoulder to the middle toe, are nearly an inch and three quarters long. Its feet are composed of five toes, the extremity of which is armed with a brown claw of no great strength, whose end is tipped with black."

The same author, speaking of the immense multitudes of lizards which are found in eastern countries, adds, "I am positive that I can say, without exaggeration, that the number I saw one day in the great court of the temple of the sun at Balbec, amounted to many thousands. The ground, the walls, and the stones, were covered with them; and the various colours of which they consisted, made a very extraordinary appearance, glittering under the sun, in which they lay sleeping and basking."

69. LACERTA RUFESCENS, *Greater Scink.*

Specif. Char.—Colour yellowish, rufous; feet short; tail of moderate length.

This species sometimes exceeds 15 inches in total length. The head is covered in front with large angular scales; the legs are short and thick; the feet pentadactylous, and furnished with small claws.

It is a native of Arabia and Egypt, living both on land and in water. It is frequent on the shores of the Nile. It is also met with in some European islands, and particularly in the island of Cyprus.

70. LACERTA LONGICAUDA, *Long-tailed Scink.*

Specif. Char.—Colour olivaceous yellow; tail very long.

The great length of the tail in this animal forms the specific distinction; the colour, which is greenish yellow, varies in the shade in different individuals.

It is said to be a native of America, and frequents the sea coasts, where it feeds on small crabs and spiders.

71. LACERTA MAEOUYA, *Mabouya Scink.*

Specif. Char.—Colour golden yellow; sides brownish; jaws equal; tail of middling length.

The length of this species is about eight inches; it greatly resembles the common scink, but differs from it in the length of the legs, and the jaws being equal.

It is a native of America, of Jamaica, and some other West India islands. It is also found in the island of Sardinia.

72. LACERTA OCCIDUA, *Galliwasp.*

Specif. Char.—Colour brownish; transverse bands somewhat waved; legs short; tail of middling length.

Except being larger, somewhat thicker, and having

a tail proportionally shorter, this species comes very near the greater scink. It is about two feet in total length. The teeth are small in front; but as they approach the back part of the jaws, they gradually increase in size, like the *molars* teeth of the mammalia.

The galliwasp is a native of the American islands. It is very common in woody and marshy places in Jamaica, and has been reckoned, but without foundation, a poisonous reptile.

Var. *Lacerta scincoides*, *australasian galliwasp.*—This, although it is of a darker colour, has a longer tail, and larger scales, is considered only as a variety of the former. On each side of the neck there is commonly a longitudinal brown spot.

It is a native of New Holland.

73. LACERTA GUTTATA, *Spotted Scink.*

Specif. Char.—Colour gray, spotted with white; tail long, marked with four transverse black bands, and black tip.

This species does not exceed three inches in length. It is a native of the Ural desert.

74. LACERTA OCELLATA, *Ocellated Scink.*

Specif. Char.—Colour greenish gray, white beneath, marked above with roundish ocellated brown spots, which have white rectangular disks.

This species is about a span long. The body is depressed; the feet are short and pentadactylous. It has no femoral warts.

It is a native of Egypt, and frequents houses.

SECT. VIII. SALAMANDERS, *Newts* or *Efts.*

The species included under this section have soft skins, and some of them are water lizards.

75. LACERTA SALAMANDRA, *Salamander.*

Specif. Char.—Colour black, spotted with golden yellow; tail round, and of moderate length.

The colours of the salamander afford sufficient marks of distinction. It is of a deep shining black, variegated with large oblong and irregular spots of bright orange yellow. The sides are marked with many large transverse wrinkles. The parotid glands form protuberances on each side of the head. On the back and sides of the body there are several large open pores, from which is exuded a peculiar fluid, which serves to lubricate the skin. This fluid is of an acrid nature; and when the animal is irritated, is copiously secreted, and even it is supposed, ejected to some distance for its defence. It is in general from seven to eight inches in length. Sometimes it is seen entirely black.

The salamander is a native of many parts of Germany, Italy, France, and other parts of Europe, delighting in moist shady places, woods, &c. During the winter it conceals itself in recesses under ground, in the cavities of old walls, or about the roots of old trees.

This species lives chiefly on insects, small snails, &c. It is capable of living in waters as well as on land, and sometimes resorts to stagnant pools. It is slow in its motions, and torpid in its manners.

The

Lizards.

The salamander is viviparous. The young are produced perfectly formed in the same way as the viper. It is said that it retires to the water to deposit its young, the number of which at one birth amounts to 30 or 40, and when they are first excluded, they are furnished with branchial fins on each side of the neck, which are temporary organs, and are afterwards obliterated like those of the tadpole.

Many popular errors concerning the salamander have long prevailed. One of these was, that it was a venomous animal, and that its poison is of so malignant a nature, as scarcely to admit of any remedy. It is now, however, found from the observations of later naturalists to be perfectly innocent, and although the fluid secreted from the skin may be noxious to smaller animals, it is incapable of inflicting either wound or poison on any large animal. In an experiment made on purpose, a gray lizard, which had bitten a salamander, and swallowed some of the fluid secreted from the skin, was almost immediately seized with convulsions, and soon after died. It was another popular error that the salamander could exist uninjured in the fire, and that it could even extinguish it by means of the fluid secreted from its skin. This fluid, it is probable, is secreted in greater abundance when the animal is exposed to heat, and thus it is protected for a short time against the action of the fire, which can produce no effect till the moisture on the skin is evaporated; and from this circumstance, and hasty observation, has arisen the improbable story of its being able to resist the action of fire.

76. LACERTA VULGARIS, *Common Newt.*

Specif. Char.—Colour yellowish brown; dorsal line double; abdomen orange coloured, spotted with brown.

This species is the smallest of the British lizards, the general length not exceeding three inches and a half.

It is a native of Europe, and is found in gardens in the neighbourhood of dunghills, &c. Like the slug and toad, it makes its way into cellars. It is altogether a land species, and it seems to be viviparous; for some of a very small size, yet perfectly formed, have been discovered at a very great distance from any water.

77. LACERTA PALUSTRIS, *Great Water Newt.*

Specif. Char.—Colour blackish; sides speckled with white; abdomen orange, with irregular black spots.

This species is smaller in size, and marked with a different distribution of colours, but in its general appearance it bears a considerable resemblance to the salamander. It is from five to six inches in length. The tail is flat, with thin sharp edges, and terminating in a point; on each side of it in the male there is a silvery white broad band, accompanied with a bluish tinge. This stripe and the dorsal crest are sometimes wanting in the female.

It is a native of Europe, but is rare in Britain. It frequents stagnant waters in cool shady places, and lives entirely on insects. It is to larger animals quite innoxious; but the fluid exuded from its skin seems to act as a poison on small animals.

78. LACERTA AQUATICA, *Common Water Newt.*

Lizards.

Specif. Char.—Colour olive brown, spotted with black; abdomen orange-coloured; tail sharp-edged and sinuated.

The general length of this species is from three to four inches. The male is readily distinguished from the female by a conspicuous dorsal crest, which is more elevated, and more regularly sinuated than that of the former species. This broad crest is very transparent, and when examined with a magnifying glass, shews the ramifications of the blood vessels and the circulation of the blood. In the female the dorsal crest is nearly wanting. The colour of the male is olive brown, marked with numerous round black spots, which are largest on the sides and tail. The female is of a pale yellowish brown, and the spots are much less distinct. The fore feet are tetradactylous; the hind feet pentadactylous, and in all the claws are wanting; but with regard to the colour, the breadth of the tail, and that of the toes, it ought to be observed, that the water newt, at different times of the year, different states of the weather, and even in the course of the same day, is subject to considerable variation.

This species is a native of Europe, and is met with in Britain in all soft stagnant waters.

This animal breeds early in the spring, and deposits small oblong strings or clusters of spawn. The ova, according to Spallanzani, are of a kidney shape, and the larva are ready formed, because long before they leave the gluten, their motions are brisk and frequent. In about 10 days they extricate themselves from the gluten. When they are first excluded, the branchial fins are distinctly seen, and soon after the fore legs appear. After a fortnight the hind legs are visible, and about the beginning of September the branchial fins become obliterated, and the animal assumes its perfect form. While the animal remains in the larva state, it is furnished with a triple pair of ramified branchial fins on each side of the neck, which gives it the appearance of a small fish.

The water newt frequently casts its skin, which may be occasionally seen floating on the waters which they frequent, and is sometimes so perfect as to represent the whole form of the complete animal. The reproductive power of the water newt is a striking circumstance in its natural history. They have been known to have their legs, tails, and even the eyes, according to some, completely restored, after they were cut off or destroyed. This animal is also remarkable for its tenacity of life. Cases have occurred in which the water newt has been found completely inclosed in a mass of ice, in which it must have remained for weeks, or even months, and yet, when the ice is melted, the animal was restored to its former health and vigour. Yet it is very readily destroyed by the application of certain substances. The water newt immersed in salt water, soon dies; or even by having common salt rubbed on the back for a short time.

79. *Leverian Water Newt.*

This is a very large species of the water newt, described by Dr Shaw, and of which there is a specimen in the Leverian museum. The total length is $17\frac{1}{2}$ inches, and

Lizards. and of this the tail measures $6\frac{1}{2}$ inches. The head is flattened, the mouth moderately wide, and the upper jaw is furnished in front with two concentric rows of numerous, small, bristly teeth. The under jaw has only a single row. The eyes are small, round, and situated on each side of the front of the head, so that they are very remote from each other. The colour is pale brown, marked in a confluent manner with darker variegations. The legs are about one inch in length, and they are all furnished, along their whole length behind, with a dilated skin or crest. The tail is like that of the common water newt, but is shorter, and less deeply finned.

Its native country, and farther particulars of its natural history, are unknown.

80. *LACERTA MACULATA*, *Spotted Water Newt.*

Specif. Char.—Colour blackish; a double row of white spots down the back.

The length of this species is about five inches. The head is large; there are four toes on the fore feet, and five on the hind. The colour is deep brown, and the double row of white spots, which begins at the top of the head and continues to the tail, becomes a single row to the end.

It is a native of Carolina, and inhabits ponds, ditches, and stagnant waters.

SECT. IX. SNAKE LIZARDS.

The species belonging to this section have very long bodies, and short legs.

81. *LACERTA CHALCIDES*, *Chalcides Lizard.*

Specif. Char.—Colour ferruginous; feet tetradactylous; body long, and marked with six brown dorsal lines.

The usual length of this animal is about eight or nine inches; but it is sometimes found only a few inches long, and sometimes exceeds a foot. The head is anteriorly covered with large scales; the snout is tapering; the eyes are small, and the openings of the ears are very distinct. The colour is ferruginous or chestnut brown above, and yellowish brown beneath.

This animal is a native of Africa and the warmer parts of Europe, frequenting moist shady places. It is quite inoffensive, and feeds on insects, small worms, &c. The motions of the chalcides are rather slow. It is viviparous, and is said to produce a great number of young.

82. *Annulated Chalcides.* *Chalcide Cope.*

This is nearly allied to the former, but differs from it in having square scales, and in being marked through its whole length with a continued series of annuli or rings, to the number of 48. The length of the body is about $2\frac{1}{2}$ inches, and is somewhat shorter than the tail. The feet are shorter than in the former species, and are all tetradactylous.

The native country of this species is unknown.

83. *LACERTA SERPENS*, *Serpent Lizard.*

Specif. Char.—Head, body, and tail cylindrical; feet small, remote, pentadactylous.

VOL. VIII. Part I.

The length of this species is about $5\frac{1}{2}$ inches. The colour is cinereous or pale ferruginous above, marked with from 15 to 20 dusky lines; beneath it is ash coloured, with a silvery gloss. It is entirely covered with imbricated scales.

This animal is a native of Java.

84. *LACERTA ANGUINA*, *Snake Lizard.*

Specif. Char.—Body long; tail very long; feet oval-shaped, and without toes.

The body of this species measures four, the whole length 15 inches. The colour is brown above, ash-coloured on the sides, yellowish beneath, and the upper surface is marked throughout its whole length with several dark stripes. The head is small; the legs very short, and placed near the head and vent, and seemingly terminated in one undivided process. The whole body is covered with ovate scales.

It is a native of the Cape of Good Hope, and is frequently found in the water, and about the rocks in Table bay.

85. *LACERTA APUS*, *Apodal Lizard.*

Specif. Char.—This snake-formed lizard is ferruginous, has no fore feet, and its hind feet are very short and monodactylous.

The chalcides itself does not approach so near to the snake tribe as this large and singular species of the lizard. It measures almost three feet in length, and its general appearance bears such a striking resemblance to a large snake, that it requires a very attentive examination to ascertain the difference; as it has only a pair of extremely short pointed processes by way of feet, at a great distance from the anterior parts of the body, almost on either side of the vent, and without toes. The head is rather large, and covered with large scales; the snout is tapering; the upper jaw projects a little over the lower; the mouth is of a moderate wideness, and the ears are very visible. There is no appearance of a neck, as the body gradually tapers from the head to the extremity of the tail, which is longer than the body, and terminates in a point. The whole animal is covered with rows of scales of a moderately large size, in a longitudinal direction, and emarginated at the tips. From the head to nearly half the length of the tail, a deep continued channel runs along each side of the body. Its colour is a pale chestnut, and beneath a pale yellow-brown.

Two specimens of this lizard were brought from Greece by Dr John Sibthorp, professor of botany in the university of Oxford. It is rather a singular circumstance that an animal of such magnitude should have remained so long unknown to the inquisitive naturalist.

It is a native of Greece, of the southern parts of Siberia, and unquestionably of many other parts both of Europe and Asia, although the knowledge of it has been but lately acquired, the first describer of it being Dr Pallas, by whom it was found in the south of Siberia. It frequents moist and shady places, and, as far as is yet known, is an innocent animal.

86. *LACERTA BIPES*, *Biped Lizard.*

Specif. Char.—Long bodied, cylindrical, pale yellow, speckled

Q q

speckled with brown, having no fore feet; hind feet very small, and didactylous.

This species, which is not larger in diameter than that of a goose quill, measures about six inches in length; its colour is a pale yellow, spotted with brown; the head is small, body cylindrical, tail short and taper; on each side of the vent there is a small fubulated foot, which is furnished with two small unequal toes.

It is a native of India and South America.

87. LACERTA LUMBRICOIDES, *Lumbriciform Lizard*.

Specif. Char.—Body cylindrical, two-footed, and annulated with square scales, having a lateral furrow, and no hind feet.

This is about eight inches long, and half an inch in diameter. The whole body, including head and tail,

is of the same diameter, and is covered with rings of square scales. Along each side there is a continued furrow, which separates the upper and lower surfaces. The legs are two, very short, and placed near the head. They are divided into five minute toes, which are furnished with claws. The colour of the living animal is supposed to have been green, and paler beneath.

It is a native of Mexico.

Number of species in each genus, included under the order *Reptilia*.

TESTUDO,	39
RANA,	48
DRACO,	2
LACERTA,	87
Total	176

CHAP. II. OF THE ANATOMY AND PHYSIOLOGY OF REPTILES.

HAVING in the former chapter taken a brief and comprehensive view of the classification, and such particulars of the natural history of reptiles, as were connected with the different species, we now proceed to give a slight sketch of the anatomy and physiology of this order of animals. These shall be the subjects of the two following sections. In the first we shall treat of the anatomy, in the second of the physiology of reptiles.

SECT. I. *Of the Anatomy of Reptiles.*

BETWEEN this order of animals, and the quadrupeds belonging to the class mammalia, there are many points of resemblance, making allowances for the difference of size; and hence they have been denominated *oviparous quadrupeds*. This resemblance, however, only extends to external appearance.

The body of reptiles is supported by four feet, and these form the principal external character. They are disposed like those of the mammalia, two before and two behind. With the exception of some animals which have been arranged under this order, and which have only two feet, all reptiles are furnished with four feet.

The body is furnished with a tail, which is different from that of quadrupeds, in having no hair. This is common to the tortoises and the whole of the lizard tribe. The genus *rana* is an exception to this. All the species included under it are unprovided with a tail.

The body is either lengthened, that is, when it is considerably longer than broad, as is the case with lizards; or rounded, that is, when the body, seen from above, exhibits an orbicular form, as in the tortoise and some toads.

With regard to the surface of the body, it is never covered with hairs, but sometimes with scales; such are reptiles without a tail, the salamanders and some lizards. It is sometimes covered with inequalities or asperities, the whole surface being rough with elevated points, which resemble warts or pustules. This is the case with some lizards, and several frogs and toads. The body is

covered sometimes with a shell both above and below; this bony covering protects the animal from external injury. With such a covering the genus tortoise is furnished.

In the sketch which we propose to give of the anatomy of reptiles, the parts of the body may be divided into external and internal; the external parts comprehend the head, the trunk, the tail, and the feet. Under the internal parts are included the skeleton, the muscles, and the viscera.

External Parts of the Body.

1. THE HEAD.—The head is that part of the body which is articulated with the first vertebra of the neck. It is rounded, that is, when its external surface is round in every direction, as is the case with tortoises; or flattened or depressed, when it is compressed above and below, which is the case with almost the whole order; or triangular, when the head, seen from above, represents a triangle, as in some toads and frogs.

The mouth is semicircular, when the outline forms a semicircle, as in the genus *rana*, and in almost all the lizard tribe; or inferior, when the upper jaw comes over the lower, so that the mouth necessarily occupies the lower part of the head. This is the case with the tadpole.

The beak or snout either forms an inclined plane from the top of the head to the end of the jaws, as in the chameleon, and many lizards; or conical, when the two jaws gradually diminish, as in the crocodile; or reflected upwards, when both jaws are flattened and turned upwards towards the extremity of the beak; or rounded, when they are thick and ventricose towards the extremity, as in several tortoises; or pointed, when the upper jaw terminates like the beak of a bird.

The jaws are either equal, as in most part of the genus *rana*, in many of the lizards, and salamanders; or unequal, as is the case with many of the tortoises and lizards, in which case, the upper jaw is always the longest. Among the whole order of reptiles, there is

no

Anatomy. no instance of the contrary; that is, of the lower jaw being longest, and perhaps this structure would be inconvenient, or incompatible with the nature of the animal, or its habits and mode of life.

A common error long prevailed with regard to the motion of the jaws of the crocodile. It was asserted, that this animal only moved its upper jaw; but the more accurate observations of later anatomists have proved the contrary, and that the articulations of the head and jaws of this animal are precisely the same as in other quadrupeds. The head is articulated with the last vertebra of the neck, and the lower jaw is articulated with the upper, so that the former, namely the lower jaw, only has the power of motion.

All the animals belonging to the order of reptiles, are not furnished with teeth. The tortoises and some lizards, have none. All the species belonging to the genus *rana* may be considered also as having none, the jaws being only crenulated or notched; but in other tribes belonging to this order, the teeth are conical, as those of the crocodile, which are hollow, and filled with a soft substance; or recurved, when the extremity of the tooth turns backward towards the throat, as in the Indian crocodile; or straight, as in most of the lizard tribe; compressed at the sides, as in the guana; or notched, when the summit of the tooth is truncated and crenulated, as in the horned lizard.

Tongue.—In almost all the tribes of animals belonging to this order, the tongue is peculiarly fitted for seizing their prey. The form of it varies in all the families. Another error has prevailed with regard to the tongue of the crocodile. It was said that it had no tongue, but in place of it is furnished with a strong membrane, which adheres to the two edges of the lower jaw. Even the observations of later naturalists tend to confirm this error. Denon, who had numerous opportunities of seeing the crocodile both dead and alive, in its native haunts on the borders of the Nile, believes in this opinion, that the crocodile has no tongue; but it does not appear that any accurate anatomical inspection was made, to ascertain this point, or indeed that he was accompanied by any anatomist at all, by whom alone the truth or falsehood of the opinion could be investigated. This organ of the crocodile, however, is very large, and even proportionally larger than that of the ox, but it is strongly connected with the sides of the lower jaw, and being thus fixed or tied down, cannot be stretched forwards, as is the case with other animals.

In some of the animals belonging to this order, the tongue is nearly of equal length and breadth. This is the case with the tongue of frogs, tortoises, the salamander, and the guana.

In some it is very narrow at the base, and divided in two at the extremity, as in most of the lizard tribe, which are thus furnished with a bifid tongue.

But the structure of the tongue of the chameleon, is perhaps the most singular of any belonging to the order. It is composed of a white solid flesh, 10 inches long, and about three broad. It is round, and flattish towards the end; hollow and open, somewhat resembling the termination of the trunk of the elephant. The tongue is attached to the os hyoides by a kind of trunk, of the shape of an intestine, about six inches long, and a

line in breadth. This trunk is furnished externally with a membrane, and internally with a soft, but solid and compact, nervous substance, which is with difficulty divided into fibres. It is by means of this trunk that the tongue, which is attached to it, is projected from the mouth. This is done by the extension of the trunk, and it is again drawn back by its contractile power. These motions are performed by a kind of cartilaginous stilus, to which the investing membrane is attached, and over which it is plaited like a silk stocking on the leg. This stilus is an inch long, and originates from the middle of the base of the os hyoides. In consequence of this extensile and retractile powers which the tongue of the chameleon possesses, it has obtained the epithet of *vermiform*, because in those motions it resembles those of an earth-worm.

There is no great peculiarity about the nostrils of any of this order of animals. In general, they are almost always of a round form. In some, however, they are lunulated, or shaped somewhat like a crescent, the horns of which are turned backwards. This is the case with the nostrils of the crocodile.

The eyes, in most other animals, are placed on the sides of the head; but in some they are vertical, or placed on the top of the head, as in several of the toads and the crocodiles; approximating, when the distance between the eyes is very small; or protuberant, when the globe of the eye on each side forms a considerable projection, as in those belonging to the genus *rana*, the *crocodiles*, and the *salamanders*.

The nictitating membrane, which is peculiar to some birds, belongs also to some of the animals of this order. By means of extending this membrane over the eye, the excessive brightness of sunshine, to which many of them, being natives of warm climates, are exposed, is greatly moderated, and perhaps this membrane may be useful to those animals of this order which frequent the water.

The iris of the eye is differently coloured in the animals of this order. In many it is red; in the chameleon it is of a golden yellow colour.

Externally, the ears of reptiles do not exhibit any remarkable peculiarity. The opening is more or less round, and it is usually covered with a membrane. There is no external ear, by which the vibrations of the air might be collected, and conveyed to the sense of hearing; from which it has been concluded, that this sense is more obtuse than in quadrupeds.

2. **THE TRUNK.**—The trunk of the body includes the neck, the breast, the back, the ribs, the abdomen, and the anus; and some of these parts in different reptiles, present considerable varieties.

The neck, which unites the head with the trunk, is very different in the different tribes belonging to this order. In all those included under the genus *Rana*, the head is so closely attached to the trunk, that the neck is scarcely to be distinguished. In others, however, it is considerably elongated, and quite distinct, as in the crocodile and the salamander. The neck is also pretty long in some of the tortoises. Sometimes it is covered with wrinkles or folds, when the skin forms several transverse wrinkles, as in the neck of some of the tortoises.

The breast or thorax is situated on the anterior part

Tongue of the crocodile.

Of the chameleon.

Anatomy.

Nostrils.

Eyes.

Ears.

Neck.

Thorax.

Anatomy. of the trunk; it forms a close cavity which is covered beneath by the sternum, on the sides by the ribs, and above by the vertebræ at the back bone.

The back is the upper part of the trunk, extending from the last vertebra of the neck to the first of the tail. In reptiles it is sometimes convex, sometimes more or less flattened. It is either furnished with scales, when there extends along the superior surface a row of scales from the neck to the extremity of the tail, as in the guana and horned lizard; or it is furnished with a toothed suture, when the upper extremity of the trunk terminates in a notched ridge, as in the chameleon of the Cape; or is supplied with a kind of radiated fin, somewhat resembling the fin of a fish, as in the basilisk; or it is protected with a strong bony covering, known by the name of *calipash*. This is the name by which the bony covering of the turtle is distinguished. This covering is composed of different pieces closely united to each other, and they are sometimes smooth and convex, sometimes striated and flat, disposed in three rows; and there are about 24 pieces situated on the edges of this covering.

Calipash of the turtle.

Ribs.

The ribs include the lateral parts of the trunk, from the neck to the anus. In the tortoises, the ribs are defended by the edges of the calipash, which is here united with the inferior shell, or bony covering.

Abdomen.

The abdomen or belly constitutes the inferior part of the body, and extends from the extremity of the breast or thorax to the anus. In the tortoises, this part is composed of a bony covering; and in some species belonging to this tribe, there are openings in those places which correspond to the head, the four feet, and the tail; but in some other species, as in the *testudo clausa*, there is no opening whatever, but the bony covering is transversely divided into two parts, which play on a kind of hinge, so that when the animal wishes to move, it opens the anterior division to put out the head and the fore feet; and in the same way for the opening behind. This inferior bony covering is united with the upper one by means of a cartilage placed near the middle of the body. This is usually known by the name of *calipee*. Sometimes the abdomen is covered with plates or scuta, which is the case with most of the lizards, which have on the inferior surface of the body, very large plates regularly arranged.

Calipee.

The anus is not only the passage for the evacuation of the excrement, but is besides the canal in which are contained the parts of generation of the male lizards and tortoises. The males of the animals belonging to the genus *Rana*, which are destitute of these parts, eject by this opening the fluid which impregnates the ova of the female.

3. The TAIL.—This part terminates the trunk. Many reptiles, as those belonging to the genus *Rana*, have no tail whatever; but the animals belonging to the other genera of this order are furnished with a tail of different lengths. The tail is covered with scales, as in almost all the lizards; and these scales are sometimes disposed in rings or circular bands, as in several lizards; or they are somewhat elevated, forming a kind of notched appearance on the upper surface of the tail, as in the guana.

4. The FEET. The feet of the animals belonging to this order greatly resemble those of quadrupeds; their position and articulations are nearly the same, but

they are much shorter, and placed at a greater distance from each other. The feet terminate in a certain number of toes, and thence, according to the number of the toes, assume different names; as tridactylous, tetradactylous, &c. The structure of the toes is similar to that of other animals. They are separated from each other, as in lizards; palmated, when united by means of an intermediate membrane, as in the hind feet of the frog; furnished with nails or claws at the extremity, which are sometimes flat, as in the frogs; or hooked, as in the lizards; or destitute of nails or claws, as in the salamander.

Internal Parts.

Under the internal parts are included the skeleton, the muscles, and the viscera.

1. The SKELETON.—With regard to the skeleton of reptiles, it may be observed, that the structure of the bones is less complicated than that of quadrupeds, and the texture is less compact. They possess at the same time somewhat of the transparency of cartilages. The bones may be divided into those of the head, the neck, the thorax, the spine, the tail, and the feet.

The bones of the head are composed of those of the cranium, and those of the lower jaw. In the greatest number of reptiles, the cranium consists of a single bone. The bone of the upper jaw, and that of the forehead, are completely united in the crocodile, the chameleon, and some others. They do not seem to be separated by any distinct suture. The lower jaw of the chameleon terminates on each side in a separate bone, which unites on one hand with the region of the temples, and forms on the other an angular articulation with the jaw.

The bones of the neck are composed of a series of vertebræ, the number of which varies in the different tribes of this order. The species belonging to the genus *Rana* have no cervical vertebræ; but in the other tribes the number varies, as has been mentioned, as will appear from the following table.

	Number of vertebræ.
Chameleon,	2
Most of the Lizards,	4
Crocodile,	7
Tortoise,	8

The number of processes with which the vertebræ are furnished, also varies. In those of the chameleon there are seven; but in those of the crocodile, there are nine, viz. five above, and four below.

The bones of the thorax comprehend those of the vertebral column, corresponding to this cavity, the ribs, and the sternum. The vertebræ, which correspond to the cavity of the thorax, are not the same in all the individuals belonging to this order. In the crocodile there are only 12, but in the chameleon, the number amounts to 18. Each of these vertebræ is in general furnished with seven processes, which are sometimes simple, and sometimes spiny.

The ribs are wanting in the reptiles belonging to the genus *Rana*: the salamander also is destitute of ribs. In the other tribes they are always found, but unequal in number. In the tortoise there are eight on each side; in the crocodile 12; in the chameleon 18. The ribs

ribs

Anatomy. ribs are articulated with one vertebra only; but in the structure and articulations of these bones there is a peculiarity in the crocodile and chameleon. The two first and the two last ribs of the crocodile do not terminate in the sternum. The cartilages which attach the other eight are broken, so that each rib from the vertebra to the sternum is composed of three parts, one of which is bony, the other two cartilaginous. In the chameleon the two first anterior ribs are not supported by the sternum; the four following are attached to it by means of appendages which form at the point of junction an angle with the ribs, and which are not composed of a substance purely cartilaginous, but as hard as that of the ribs. The 10 other following ribs do not reach the sternum. Each is joined to that which is opposed to it by a bony appendage, forming an arch on the middle of the thorax and abdomen. The three last are loose, separated, and as it were truncated in the middle.

Sternum. The sternum or breast-bone is a flat bone, placed on the anterior part of the thorax, the figure and dimensions of which vary considerably. In the crocodile this bone reaches to the third rib; it is composed of a single piece, having at its upper part a kind of cartilage which forms a point towards the throat, and which enlarging at the sides covers the clavicles. The sternum of the chameleon and the frog is composed of four bones, the first of which is very large.

Spine. The back-bone comprehends the vertebrae which occupy the upper part of the back, including those of the loins. In the chameleon there are 22; in the crocodile 19, and in the gray lizard 22.

The vertebrae of the tail form the posterior extremity of the spiral column. Their number is always proportional to its length. The tail of the chameleon is furnished with 50 vertebrae; that of the crocodile 33, and that of the gray lizard 60. All these vertebrae are furnished with transverse, oblique, and spinous processes, excepting those towards the end of the tail, which are usually destitute of the oblique processes.

Feet. The bones of the feet bear a considerable resemblance to those of other animals. The fore feet are composed of the scapula, the humerus, the cubitus and radius, the bones of the carpus and metacarpus, and the joints of the toes.

Scapula. The scapula or shoulder-blade is sometimes single, and sometimes double, in the animals belonging to this order. The frog, the chameleon, and the salamander, have only one; but it is of such a length that it extends from the dorsal spine to the sternum, with which it is articulated, answering the purpose of a clavicle. In the tortoises and crocodile, there are two shoulder-blades, viz. one on the back, and one placed anteriorly, and articulated with the sternum. These also perform the functions of the clavicle. The humerus is articulated on the one hand with the scapula, and with the two bones, the cubitus and radius of the arm, on the other. The two latter bones, the cubitus and radius, are placed parallel to each other, between the humerus and the bones of the carpus and metacarpus. These latter are situated between the two bones of the fore-arm, and the phalanges or joints of the toes.

The hind feet are composed also of the femur or thigh-bone, the tibia, and the peronea of the leg; the bones of the tarsus and metatarsus, and the phalanges

or joints of the toes. These, excepting that they differ somewhat in structure, bear so near a resemblance to those of the fore feet, that it would be quite unnecessary to enumerate or describe them particularly.

2. The **MUSCLES**.—The muscles are the instruments of motion. The muscles of the back of the crocodile take their origin from the vertebrae and ribs, and they are attached by means of their tendons, to the bands or rings which are formed by the tubercles of the back. These tendons act in different directions; some of them pull these bands from above downwards, while others pull them from below upwards. The use of these muscles is apparently to lock together more strongly the rings of which the tubercles of the back are composed.

The muscles of the abdomen in the same animal, which are four in number, one external, and one internal on each side, are not only different from those of other quadrupeds in number, but also in their situation and structure. The external muscle is placed upon the ribs, and the internal under them, immediately above all the viscera, which it embraces in the manner of a peritoneum. The internal muscle is attached on one side to the bones of the pelvis, and to the transverse processes of the lumbar vertebrae; and on the other it terminates in a broad tendon, which envelopes all the intestines in the form of a membrane. The fibres of these two muscles are disposed lengthwise.

3. The **VISCERA**.—The parts contained in the three great cavities of the body are the viscera. These are the brain, the heart, the lungs, the stomach, the intestines, the liver, the spleen, and the kidneys.

The brain is situated within the cavity of the skull. This organ in reptiles, is in general of small size. The brain of the chameleon, which is of a reddish or grayish red colour, is not more than a line in diameter. The same organ in the crocodile is very small, and similar to that of fishes. The cavity within which it is contained, does not exceed 14 lines in length, and about 12 in breadth and depth.

The heart is a strong muscular body, from which proceed the great arteries, and in which the great veins terminate. From the contractile force of this organ, the blood receives its first impulse. The heart in this order of animals is small. It has in general been considered as having only one ventricle and two auricles; differing from the heart of the more perfect animals, which is furnished with two ventricles and two auricles. But from the observations of later naturalists, it would appear that the structure of the heart of reptiles has not been accurately described; for, according to some anatomists and physiologists, the heart of this order of animals is really double; that is, consisting of two auricles which have a direct communication with each other, and two ventricles, as in other animals.

The lungs which constitute the principal organ of respiration, are spongy cellular bodies, in which the bronchia or air-vessels are ramified. The substance of which the lungs of reptiles are composed, is not fleshy and parenchymatous like those of quadrupeds, but they consist of a bundle of vesicles divided into two lobes. The lungs of the turtle are remarkable for a vesicle which adheres to their surface on the left side, and which may be contracted and dilated at the pleasure of the animal. It is conjectured, that it is by means of this

Anatomy.

Muscles of the back.

Of the abdomen.

Brain.

Heart.

Lungs.

this

Physiology. this organ, like the swimming bladder in fishes, that the turtle raises itself to the surface of the water.

Stomach. The stomach which is destined to receive the food, is situated between the gullet and the intestinal canal. This organ in reptiles is very like that of birds. The stomach of a crocodile four feet long is not larger than four inches in length, and the same in breadth; and although the fibres of which it is composed are neither so strong, nor so numerous, as those of the stomach of birds, they form a body which is incapable of extension or enlargement. This renders it extremely difficult to believe what is said of the crocodile, of its prodigious voracity, swallowing animals of so considerable a size, since it is neither furnished with teeth fit for the mastication of its food, nor a stomach of sufficient capacity to receive so great a quantity.

Intestines. The intestines form a canal composed of different convolutions, extending from the stomach to the anus. It is quite unnecessary to enter into a minuter description, than merely to state, that they are divided, as in other animals, into great and small. In the crocodile and other reptiles, the intestines going out from the stomach, form two great convolutions similar to those of birds. They are afterwards convoluted in different ways, till they reach the bottom of the cavity and terminate in the anus.

Liver. The liver is the organ destined for the secretion of bile. In this order of animals it is large, and divided into two unequal lobes, between which the heart is situated. The right lobe is somewhat larger, and the gall bladder occupies the middle of this lobe.

Spleen. The spleen is an organ placed on the left side. In this situation it is exposed to the pressure of the diaphragm and the abdominal muscles. The spleen of frogs is double, and of an oblong form. In the crocodile it is oval, somewhat oblong and equal at the two extremities. The substance of which this organ is composed, consists of a great number of large whitish points on a dark red ground.

Kidneys, &c. The kidneys are bodies of an oval lengthened form, situated within the abdomen, and destined for the secretion of urine. In the frog, between the kidneys and the testicles, there are certain appendages which resemble some kind of leaves. The kidneys are attached to the back, having at their posterior extremity the femoral vessels. The urinary bladder is situated near the orifice of the anus.

SECT. II. *Of the Physiology, Manners, and Habits of Reptiles.*

WE shall now, according to the arrangement proposed, make a few observations on the physiology, manners and habits of reptiles.

From the small proportion of brain, and dull habits of reptiles, it seems to be justly concluded that their senses are not very acute.

SENSE OF SIGHT.—Of all the senses, that of sight is probably the most perfect among reptiles; but as their most common haunts are on the shores of the ocean, on the margin of lakes, and of stagnant waters, and on the banks of rivers, where the rays of the sun are strongly and incessantly reflected, it was necessary that the eyes of these animals should be protected from the too powerful impressions of light. For this purpose the moveable

eye-lids, and the nictitating membrane, are peculiarly fitted; as by their means the animal is enabled to diminish the quantity of light received into the eye. The peculiar power which many of them possess also of contracting and dilating the pupil at pleasure, like the cat, and some other animals, which seek their prey in the dark, extends the utility of this organ, and renders it more sensible and delicate. From this peculiar structure of the eye, the animal is enabled to see objects at a considerable distance, and is thus fitted to pursue its prey in the dark, or at great depths under the surface of the water; circumstances which are highly necessary for the situation in which many of the tribes of reptiles are placed, and exactly accommodated to their habits and mode of life.

SENSE OF HEARING.—This sense in reptiles is probably not very acute. The structure of the internal ear is considerably different from that of the more perfect animals. Indeed some of the parts which seem to render perception more acute, are wanting in these animals. There is neither *cochlea* nor *fenestra ovalis*, and the semicircular canals are destitute of extremities. The membrane of the tympanum is very thick, and the bone immediately connected with it is of a very irregular figure. But, besides, these animals have no external ear whatever, by which means the vibrations of the air might be collected, and condensed in the seat of sensation. In place of these external parts, there are only very narrow openings, which can admit but a small number of vibratory undulations. As a farther proof of the dulness of this sense in these animals, few of them emit any sound, excepting a harsh croaking, whence it may be concluded, that their perception of sound is very indistinct, or they are destitute of the organs necessary to express it; otherwise, with these requisites, the habit of hearing distinctly would very soon improve the power of expression.

SENSE OF SMELLING.—Almost all reptiles are furnished with the external organs of this sense. The nostrils of the crocodile are placed in a round space, filled with a black, soft, and spongy substance; those of the tortoise and lizard occupy the extremity of the snout, and consist of two very distinct openings. It appears, indeed, from anatomical inspection, that the nerves which terminate in these organs are of a very large size, which circumstance leads us to conclude, that the sense of smelling must be pretty acute. But when it is considered that a great proportion of reptiles have their abode in the midst of putrid marshes, it would incline us to suppose, that the sense of smelling is not very acute.

Dr Townson, in some experiments which he made with the water lizard, very justly concludes, that their sense of smell is extremely acute. "I kept, says he, a considerable number of water lizards, in a jar, which I fed from time to time with worms; if they were in the greatest stillness, and I dropt in a worm ever so gently, they all immediately began to fight, each attacking its neighbour and seizing it by the foot or tail. This was not a contention for the worm, which often lay for a short time unnoticed, but it originated rather from the acuteness of their sense of smell, which immediately informed them of the presence of their food, and in the dullness of their discriminating powers. This is similar to what I have invariably observed in frogs and toads,

Phy.ology.

toads, which will suffer their natural food to remain before them untouched, yet seize it instantly on the smallest motion it makes. It was from a knowledge of this instinct that I was able in winter to feed my constant companion and favourite pet, Musidora.

"Before the flies, which were her usual food, had disappeared in autumn, I collected a great quantity as provision for winter. When I laid them before her, she took no notice of them; but the moment I moved them with my breath she sprung and ate them. Once when flies were scarce, I cut some flesh of a tortoise into small pieces, and moved them by the same means, she seized them, but instantly rejected them from her tongue. After I had obtained her confidence, she ate from my fingers dead as well as living flies.

"Frogs will fly at the moving shadow of any small objects, and both frogs and toads will soon become so tame as to sit on one's hand and be carried from one side of the room to the other, to catch the flies as they fettle on the wall. At Gottingen, I made them my guards for keeping these troublesome creatures from my desert of fruit, and they acquitted themselves to my satisfaction. I have seen the small tree-frogs eat humble bees, not indeed without a battle; they are in general obliged to reject them, being incommoded by their stings and hairy roughness; but at each attempt the bee is further covered with the viscid matter from their tongue, and is then easily swallowed.

"Nothing appears more awkward and ludicrous than a frog engaged with a large worm or little snake; for nature seems to have put a restraint upon their voracity, by forming them very inapt to seize and hold their larger prey. One of my largest frogs, whether the *rana temporaria*, or *esculenta*, I forget, swallowed in my presence an *anguis fragilis* near a span long, which, in its struggles, frequently got half its body out again; when completely swallowed, its contortions were very visible in the flaccid sides of the conqueror*."

SENSE OF TASTE.—If the perception of taste is to be taken in proportion to the sensibility of the organ which is the seat of it, this sense in reptiles must be considered as the feeblest of the whole. The tongue of most reptiles is rather to be considered as an instrument for seizing its prey, than as an organ destined for the perception of taste; and for the former purpose it is remarkably fitted, both from its structure and mechanism, by which means the animal can project it instantaneously from its mouth, and also from the viscid fluid which is secreted on its surface. We have already described, in speaking of the anatomy of reptiles, this peculiarity of structure in the tongue of the chameleon.

SENSE OF TOUCH.—This sense cannot be supposed to be very acute in this order of animals. Most of them have the body covered with hard scales, with large tubercles, or with a strong bony substance. In a great number belonging to this order, the extremities of the feet even are furnished with scales; and the toes are so united together, that they can only be applied with difficulty to the surface of bodies. And if in some lizards it is found that the toes are long, and distinctly separated from each other, the inferior surface is covered, either with a hard skin, or with very thick scales, which must undoubtedly deprive this part of all

sensibility. The sense of touch, therefore, in reptiles, may, in general, be considered as dull and imperfect.

CIRCULATION OF THE BLOOD.—In animals which have been usually dignified with the name of *perfect*, and which are furnished with a double heart, the blood which has been collected from all parts of the body, returns to the right side of the heart; is thence conveyed to the lungs; from the lungs it passes to the left side of the heart, and thence is again distributed through the body. But this course of the blood can only go on when the function of respiration continues without interruption; because on the cessation of the action of the lungs, the circulation through them is interrupted; and therefore, without some other structure of the heart, the circulation through the body must stop, and the death of the animal ensue.

Many of the animals included under the order of reptiles are distinguished by a peculiarity of structure, which allows the circulation to go on during the necessary interruption of the function of respiration to which they are subjected. The blood therefore, instead of passing through the lungs, is conveyed through an oblong opening called *foramen ovale*, situated between the two auricles, and is discharged directly from the pulmonary artery into the aorta. Hence it is that these animals come under the denomination of cold-blooded. This diminished temperature of the blood is ascribed to the less complicated circulation which goes on in their system. For the blood in the course of the circulation being less exposed to the action of the air in the lungs, undergoes fewer of these changes, on which, according to the present chemical theory of respiration, the temperature of the body, or animal heat, depends.

RESPIRATION.—The function of respiration exhibits one of the greatest peculiarities in the animals belonging to the order of reptiles. For, as in these animals the structure of the thorax, and the other parts necessary to the process of respiration in other animals are quite different, the means also by which it is conducted in them must also be different. It is to Dr Townson that we are indebted for the elucidation of this part of the physiology of reptiles. This naturalist, as he himself observes, at least revived a doctrine which had been acknowledged by former physiologists, to whom it seems to have been distinctly known. Among these he mentions Laurenti, who, in his *Synopsis Reptilium*, has derived the character of his class from the peculiar mode of respiration of these animals, of which he says that they are furnished with lungs, but are destitute of diaphragm and ribs, but by means of the gular pouch the air is alternately drawn into this reservoir, and by its contractions propelled to the lungs.

In quadrupeds, Dr Townson observes, there are no perceptible motions in the throat, excepting those which accompany the process of deglutition; but in the frog tribe, whether they are awake or asleep, if they are not excluded from the air, there are some remarkable motions of the throat which are quick and constant: these are the motions which are subservient to inspiration. The bony and muscular parts, which in hot-blooded animals are the mechanical instruments of respiration are entirely wanting in this order of amphibia. It must then be by means of some other contrivance, that they are enabled to fill the lungs with air. In the hot-blooded

Physiology.

Peculiarities of the circulation.

Respiration different from that of other animals.

Process of inspiration.

* *Tracts on Nat. Hist.* p. 113. Very feeble.

Physiology. blooded animals the alternate contraction and dilatation of the thorax effects this, but in this tribe the same purpose is accomplished by the dilatations and contractions of the throat. When the cavity of the throat is enlarged the air rushes through the nostrils and fills it; the nostrils being closed by their proper muscles, the glottis is opened; the muscles designed for this office contract, diminish the cavity of the throat, and impel the air which is contained in it into the lungs; and in this way, he adds, is inspiration performed in these animals.

"When the lungs, says he, were laid bare, I have observed that these did not inflate, if the frog, exhausted with pain and loss of blood, or when the nostrils were covered with it, opened its mouth to take in a greater supply of air, till the throat contracted; this, then, was the immediate consequence. Likewise, if I put a tube down the throat, the glottis and mouth being by this kept open, the lungs collapsed, and in this state remained; but as soon as the tube was removed, respiration immediately recommenced: nothing similar to this is to be observed in hot-blooded animals

Of expiration.

"Expiration is very easily accomplished; for, the glottis and the nostrils being open, the lungs by their own contraction from a state of distention, and by their own weight, aided by that of superincumbent parts, will gradually expel the air; but the muscles which cover the sides act also on this occasion, and in their croakings, (which, in the time of their amours, are heard to a great distance), with great force. But in the ordinary expirations of these animals, no more than in quadrupeds, do the lungs wholly collapse; if not viewed with attention, no motion is ever perceived in their sides, though there is a regular contraction and distention. They likewise have the faculty of compressing one lobe of the lungs singly, by the contraction of the muscles of that side; this is easily induced by touching them gently on the side with a pin or other sharp body.

"As these animals are known to be able to live a much longer time without air than those with hot blood, it has been said by many that they respire slower. But although probably they do not vitiate so much air, they respire very rapidly. Man respire about twenty times in a minute: and, according to Forgaro, birds, which breathe the quickest of all hot-blooded animals, from 25 to 50; but the esculent frog (*rana esculenta*), respire about 70 times in a minute; the *rana variabilis* (a species of toad), about 100, and the tree frog (*rana arborea*), so rapidly that I could not reckon the number of the motions of its throat. The contractions of the throat I have considered as inspirations; yet, as the nostrils do not close with each contraction, I cannot venture to affirm that at each the whole contents of the throat are driven into the lungs. As there is frequently one contraction in four or five greater than the rest, it may be then that the greatest quantity of air is driven into them. When these animals sleep, and in cold weather, these motions are slower and more feeble.

"According then to the doctrine which I have advanced on the mechanism of respiration in the frog tribe, which may easily be subjected to experiment, and then

thrown aside, if it bears not this test, but candidly received if it does, their lungs possess no secret power of dilatation, any more than those of hot-blooded animals. In both, this organ is inactive in respiration, which process principally differs in this, that, whilst in the *hot-blooded the air is sucked into the lungs by the expansion of the thorax; it is driven into them, in the frog tribe, by the motions of the throat.*

"Let us now proceed to examine anatomically the mechanism subservient to respiration; and when, for the sake of brevity, in speaking of the throat, I make use of the terms of muscles of inspiration and expiration, I mean by the former those muscles which serve for forming a vacuum in the throat, and by the latter those which serve to diminish it.

"INSTRUMENTS OF RESPIRATION.—When the skin is stripped off from the throat, a broad muscle comes into view, which is the mylo-hyoideus. It covers the whole throat, being extended from the end of the maxilla to the condyles; its fibres run transversely, and are inserted into the maxilla through its whole length. In the middle, from the point of this bone, it becomes thin and membranous, but at the condyles thicker; it is not united with the os hyoides, as in man, but slightly connected with the skin. When the cavity of the throat is diminished, its muscular fibres are seen evidently to contract, but chiefly at the condyles, where the muscle is thickest. Thus, this muscle seems well adapted to assist in driving the air from the throat into the lungs; nevertheless, if it be cut away, respiration continues.

"The mylo-hyoideus being cut away, the genio-hyoidei appear; and, under these, in the middle, is the muscle of the tongue; the muscle at the point of the maxilla, the sterno-hyoidei and the coraco-hyoidei are likewise seen. The genio-hyoidei, which are slit where the sterno-hyoidei are inserted in the os hyoides, from their direction and connection, ought, one would think, greatly to assist in drawing the os hyoides forwards, and, by this means diminish the cavity of the throat; yet these being cut away, respiration continues.

"The sterno-hyoidei are strong and powerful; they rise from the whole length of the last bone of the sternum, and are inserted all along the os hyoides. As the os hyoides is not in the same direction as the sternum, but higher, and its cornua, which are fastened by the stylo-hyoidei, likewise higher and oblique, these muscles in their contractions draw this bone downwards and backwards, and thus form a cavity in the throat. These are the principal muscles used in forming this cavity, and when they are cut respiration ceases.

"The coraco-hyoidei rise from the inferior side of the neck of the scapula, and are inserted into the os hyoides near the insertions of the sterno-hyoidei. They direct the movements of the os hyoides, and draw it downwards; one being cut, this bone loses its natural direction and inclines to the other side.

"If we search deeper, we find the stylo-hyoidei muscles, otherwise the *constrictores medii pharyngis*, (B) of which there are three pairs (C). One pair, which is stronger

(B) Either the stylo-hyoidei or these constrictors are wanting.

(C) In the common toad (*Rana Bufo*), and in the *Rana variabilis*, I only found two pairs.

Physiology. stronger than the rest, rises from the posterior region of the ear, and is inserted into the points of the cornua of the os hyoides. The other two pairs have the same origin, and are likewise inserted into the cornua of the same bone, but more forward. These muscles are likewise of great moment in contracting the cavity of the throat, by elevating the os hyoides, and drawing it forward. I have observed some muscular fibres in the vicinity of the stylo-hyoidei, upon the membrane which lies immediately under the muscles now described, and which forms the interior part of the throat: these may assist likewise as constrictors.

“ If we take away the muscles and the membrane of the throat, leaving only the sterno-hyoidei muscles, although respiration is now totally destroyed, the motions used in respiration continue. The os hyoides is still drawn backwards and forwards, and the glottis opens and shuts, but the lungs remain collapsed; if even all the muscles which move the os hyoides, are cut away, the glottis, whose muscles remain untouched, continues to open and shut, just as in hot-blooded animals, whose respiration is destroyed by a large wound in the thorax, efforts to respire continue, though ineffectual, to remove the painful sensation of incipient suffocation.

“ On expiration little is to be said; I have always found the lungs of these animals, whether alive or dead, to collapse as soon as the glottis is open; yet, as I have already observed, the oblique muscles, which extend from the glottis to the os pubis, and thus envelope the lungs through their whole extent, have a great power to compress them, and thus produce expiration. Whether I have properly applied the name of obliques to these muscles I will not contend, as I have not examined them with particular care; they may probably be composed of several muscles, but thus much I have observed that their fibres run more or less transversely, and are therefore well adapted to produce this

* *Tracts on effect **,
Nat Hist.
p. 17.

PROPAGATION OF REPTILES.—Although reptiles, from their senses being less acute than those of other animals, seem in general dull and stupid; on the return of spring, they exhibit a very different character. As the warm season advances, they become lively and active, and thus shew that they are actuated by a new set of desires. It is at this time that the frog tribe, which at no other season of the year emits the smallest sound, become remarkable for the croaking and disagreeable noise, by means of which they express these new or once dormant feelings. When these feelings acquire force, even some of the external parts of some of the frog tribe undergo a change. The fore feet of the male are then furnished with a kind of wart, which is supplied with papillae, that it may more firmly attach itself to the female. The male then places itself on the back of the female, and embraces her so strongly with the fore feet, that it can only be separated by a considerable force. In this situation the two remain together for about a month. About the end of this time, or sooner or later, according to the temperature of the season, the female begins to exclude the ova. The eggs form a kind of string, and are united together by a viscid matter, and included in a thick glairy substance. At the moment that the ova are excluded by the female, the male ejects a fluid with which they are impregnated,

Change on
the male
frog.

at the same time giving a peculiar cry during the course of this process. So strongly is the male attached to the female, that nothing can disturb or interrupt his operations. Nay, what will appear still more surprising, in an experiment by Spallanzani, in which the head of a male frog was cut off in this situation, the animal continued for some time to impregnate the ova as they were excluded, and died only at the end of four hours.

When the ovum of the frog is examined with the microscope, a small point is distinguished, black on the one side and white on the other, placed in the centre of a globule, whose glutinous and transparent substance is surrounded with two concentric membranes, which are analogous to the shell of the egg. At the end of a certain time, which is longer or shorter, according to the temperature of the season, the embryo begins to be developed, and is afterwards known by the name of tadpole. Spallanzani has observed, that the process of incubation or hatching in the ova of the toad goes on, although the temperature of the atmosphere does not exceed 6° above zero of Reaumur's thermometer, which is equal to about 39° of Fahrenheit.

It is unnecessary to mention, that the ova of the frog are deposited and hatched in water. It may be observed also that this process is interrupted in the ova of the toad, which happen to be dropt on the earth, unless they are supplied with moisture.

The tadpole, as the process of incubation proceeds, and the organs which are destined to perform the functions of life are developed, exhausts the glutinous matter with which it is surrounded; this gradually dilates; and the more it increases in volume, the less is the quantity of its mass. It becomes at length only a light and almost invisible substance, from which the tadpole makes a short occasional excursion in the water, in making its first efforts in swimming; but returns again, finding itself either unable to procure its food, or to support itself long in the water on account of the shortness of the fins, which have not yet attained their full size. But as the little animal advances in its growth, the glutinous matter, its former habitation, being entirely dissipated, it roams at large in the waters.

According to the observations of Swammerdam, a tadpole is about six lines in length at the end of 15 days after it has been deposited by the female. The first traces of the hind feet may then be seen; and the place of the toes is marked with so many small protuberances. In this stage of its progress the little animal exhibits a very different appearance from that which it assumes after the change it is to undergo. The mouth is not placed at the anterior part of the head, but on the lower surface; and when it wishes to seize any object for its prey, or to expel the air from its lungs by expiration, its motion in turning its body is so rapid and instantaneous, that the eye can scarcely follow it.

In a tadpole of 36 days old the hind legs are protruded; but the fore legs are some days later, so that to see them at the same period the animal must be opened, at least the external covering which veils in some measure, or disguises its future form. At last, at the end of about two months of confinement, which is about the middle of June, the young frog having reached its perfect form, and acquired sufficient strength, bursts from its prison. It contrives at first to contract its

Physiology. covering by elevating its back; by this the skin is torn near the head of the animal, which passes through the opening. That part of the membrane which formed the mouth of the tadpole is retracted over the body; the fore-legs are successively unfolded; and the skin pushed to the posterior extremity of the body, leaves the whole of it, as well as the hind-legs and the tail, uncovered. The tail then gradually diminishing in volume, at last entirely disappears, so that the smallest trace of it no longer remains in the perfect animal.

Time of the turtle breeding varies,

According to the situation of the countries in which they are found, the temperature of the climate, and the period and duration of the rainy seasons in tropical regions, the time of the turtle depositing its eggs is regulated. At this season the female quits the ocean, and often, it is said, makes a voyage of 300 leagues to find a safe and convenient spot for the reception of the embryos of her future offspring. The male, according to the accounts of some naturalists, accompanies the female in this expedition, with the view of reconducting her to their former haunts. We are informed that they arrive in such multitudes on the banks of the Oroonoko about the beginning of March, that there is not sufficient space on the shore to contain them, so that vast numbers are seen with their heads above water, waiting the departure of those on land, that they may occupy their place. When the turtle has reached the shore, she fixes on a spot covered with sand or gravel; digs with her fins, in a place beyond the reach of the tide, one or more holes of about a foot broad and two feet deep; and there deposits her eggs to the number of more than a hundred. She then covers them with a little sand, but so lightly, that the action of the rays of the sun may not be interrupted hatching them. The turtle deposits her eggs commonly at three different times, a period of fourteen days intervening between each time. The dangers to which these animals are exposed, when the light of day favours the pursuit of their enemies, and perhaps also, it has been conjectured, the fear of suffering from the burning rays of the sun, make them almost always prefer the darkness and temperate coolness of night to come on shore for this purpose.

The period of hatching is longer or shorter according to the temperature of the climate. In more temperate regions, it continues about 20 or 25 days. At the island of St Vincent, (one of the Cape de Verd islands), this process is completed in 17 days; and Gumilla the historian of the river Oroonoko asserts, that three days only are required for hatching on the banks of this river. He placed, he says, a stick near the place where the turtle deposited her eggs, and at the end of three days, so great is the influence of the sun upon the sand, the small turtles had made their appearance.

Travellers who have had opportunities of observing the small turtles soon after they are hatched, when they are only about an inch long, inform us, that in this state they do not quit their holes during the day, being instinctively warned to protect themselves in this manner from the heat of the sun, and the voracity of birds of prey, but they wait till night to make their way to the ocean. "I have been often astonished, (says Gumilla,) when I have observed that the place where they have been hatched, being sometimes half a league distant from the river, they direct their course towards it

without any deviation by the shortest possible way. *Physiology.* I have sometimes carried the young turtle to a great distance from the water. I have covered them up and made several holes for them that they might wander. But I no sooner left them at liberty, than they took the direct course to the river, without turning either to the right hand or to the left." The instinct with which these little animals are impressed, conducts them towards the nearest waters, where they find safety and proper food. They move on very slowly, and as yet too feeble to resist the force of the waves, great numbers are thrown back by the surge on the sea shore, where sea fowl, crocodiles, tigers, and other animals are in waiting to devour them, so that but a small number escapes the numerous dangers to which they are constantly exposed.

It is also at the return of the spring season that the alligator deposits its eggs. It lays about 100 in the space of one or two days; and in the same way as the turtle, covers them with sand, and it is said, rolls itself round the place, that it may be the better concealed from its enemies. Having thus secured its future offspring, it returns to the water, when the process of hatching goes on by the heat of the sun. About the time that the necessary period has elapsed for the evolution of the young animal, it is said that the female returns, accompanied by the male, scrapes up the sand, and uncovering the eggs, breaks the shell, to allow the young animal to escape. It is said that the young alligator, before it leaves the eggs, is at least six inches long, and that it is rolled up, having its head placed in the centre. When the shell is broken with a stick, they bite it furiously, and sink their teeth in this substance. This seems not improbable, since it is recorded by different naturalists, that the teeth of the young alligator are completely formed before it leaves the egg.

The mode of propagation, so far as it has been observed among the tribe of lizards, is similar to that of the frog. The male remains for some time on the back of the female, embracing her closely. This does not prevent them from running about, or leaping from branch to branch. When the female is about to deposit her eggs, she makes a hole in the earth, of about two inches deep, at the foot of a tree or a wall; in that the egg is dropped and covered with the earth, and, as in the other tribes, the process of incubation is accomplished by the heat of the sun.

But some species of lizards are viviparous. This is considered by naturalists as exactly the same mode of propagation as in the others which are produced from eggs, with this difference only, that the process of incubation goes on in the former within the body of the female, and the young are excluded completely formed.

THE EGGS OF REPTILES.—The size of the eggs of the order of animals is always proportioned to that of the female by whom they are produced. From the smallest species of lizard to the huge crocodile, they may be found of every size. The smallest are scarcely more than two lines in diameter, while the largest are three inches long.

The covering of these eggs is different in the different tribes. In the greatest number, but especially in the eggs of the turtle, it is flexible, soft, and similar to moistened parchment. The eggs of the crocodile, and of some large lizards, are covered with a shell of a hard, calcareous

Physiology. calcareous substance, like that of the eggs of birds. It is however, considerably thicker, and consequently less brittle.

Used as food.

In India and America, these eggs are very much sought after, and are esteemed by the natives a very rich and delicate food. About the time that the turtle deposits its eggs on the banks of the Oroonoko, the neighbouring inhabitants repair to the banks of that river with their families, for the purpose of collecting them; and they not only live upon them at this time of the year, but dry them, that they may carry them home to be laid up in store for their future sustenance.

It is said that the Indians are extremely fond of the eggs of the alligator, which they search out with great industry, and rejoice when they discover the place where they have been deposited. They bake them when they prepare them for food, and although the young animal has begun to be evolved, or is nearly formed, they are not less scrupulous in eating them.

Reptiles feed voraciously.

FOOD OF REPTILES.—It is only in extraordinary cases that reptiles abstain from food for any length of time. When they are at perfect liberty, and find that kind of food which is suited to their nature, they in general indulge in it voraciously. Frogs and lizards feed on leeches, worms, snails, beetles, and different species of winged insects. Some of the toads live on aquatic plants; the turtles find in the water or on the land, vegetables and shell-fish; the crocodile is carnivorous, and devours, greedily, fishes, sea-fowl, and turtles; and when pressed by hunger, attacks men, but especially, it is said, the negro race, whom he prefers to others. This latter fact has probably no foundation whatever. The very largest crocodiles, which are more easily seen and avoided, it is said, employ some artifice in seizing their prey. They watch about the margin of stagnant waters, and lie there covered with mud, like a fallen tree, remain immovable, and patiently wait the favourable moment to seize some unsuspecting animal. Sometimes when they swim down any large river, they stop at the most frequented places, and raise only the upper part of their head above the surface of the water. In this attitude, which leaves the eyes at liberty, they surprise the animals which come to cool themselves, or to drink in the river. As soon as they perceive any one, they plunge under the water, swim towards it, and seize it by the limbs, drag it along to drown it, and afterwards make it their prey.

Different character of reptiles in different situations.

ABODE OF REPTILES.—Reptiles, like plants, are profusely distributed over the whole surface of the globe; but from their nature and habits are more abundant and numerous in some places than in others. Some tribes live entirely on dry land, while others are confined to the bottom of the water. Others may be considered as intermediate tribes, living on the confines of the two elements, exhibiting in them the degrees and shades of different habits, which result from the diversity of forms. Among those which have their abode on dry land, as many of the tortoises, most of the lizards, the chameleons, some prefer dry and elevated situations, while others dwell in caverns or in the holes of rocks; and as these are different in their economy and habits, so we find that they are different in their motions; while the one is sluggish and inactive, moving slowly, the others spring or creep rapidly among the branches

of trees. Almost all of them, however, take the water, and swim with great facility; but they are obliged, as well as the reptiles which remain constantly in the water, to come to the surface from time to time to respire the air of the atmosphere. The intermediate tribes, or such as have their usual haunts on the limits of the land and water, can only exist in climates which correspond to their temperament. And thus they are found in innumerable multitudes in the immense extent of morass in the deluged savannahs of the new continent, where the moisture of the atmosphere and the temperature of the climate are favourable to their reproduction.

In Kamtschatka, where the cold of winter is so rigorous, no species of toad, of frog, or even of serpent, is ever seen. Lizards, however, are very numerous, which are regarded by the inhabitants with a superstitious horror. They suppose that they are sent by some evil deity, as spies on their actions, or to predict their death; and hence it is that they use every precaution to secure themselves against their mischievous effects. Wherever they find them they cut them to pieces, that they may not be able to return to the malignant being by whom they have been sent, to witness against them. Should the animal accidentally make its escape, they are seized with the most violent grief and despair. They expect every moment the approach of death, and sometimes bring on, by their fears and terror, what they so much dread. All this contributes still more to increase and strengthen this ridiculous and groundless superstition.

REPRODUCTIVE POWER OF REPTILES.—Many of the animals belonging to the order of reptiles undergo very considerable changes, in the reproduction of different parts of the body, either in the ordinary processes of nature, or when they are deprived of them by accident. The casting of the skin, and its reproduction in different reptiles, as in the toad and newt, may be regarded as a natural operation, in some way necessary to the economy of these animals. It is observed, that the water-newts frequently cast their skins; and these are occasionally seen floating in the waters which they inhabit. The skin is sometimes so perfect, that it exhibits the whole form of the complete animal.

The following account of this process by Bonnet will, we doubt not, be interesting to the reader.

“When, says he, the period of change approaches, the fine skin is observed detaching from the body. The head first loses it; then the rest of the anterior part; next the middle, and the posterior part. Sometimes the spoil, cast by the head, forms like a gauze collar or cravat around the neck; or it is adjusted on the head, like a capuchin or head-dress.

“The commencement of separation, from the back and belly, is discovered by viewing the newt obliquely from one side, in a strong light. The skin of the belly is further detached, because it falls down by its own weight.

“Approaching spoliation is recognized by conspicuous and unequivocal symptoms. The back, viewed obliquely, appears whitish, and as if covered with a spider’s web. This is the effect of the spoil beginning to separate. If closely examined with the naked eye, or a magnifier of small power, it seems composed of minute scales covering the callosities or tubercles, which flagreen the body of the newt. But, when examined

Physiology. with more attention, and in a favourable light, this epidermis is discovered to be a beautiful reticulation, the meshes of which are visible to the naked eye.

“ Many observations could be made on the texture of this delicate membrane; and these might greatly tend to elucidate the nature and origin of the epidermis, which, notwithstanding all the researches of physiologists, are so little known; and newts would afford frequent opportunities for deeply investigating the point.

“ From particular attention to the newts in my possession, I have observed, that there is not the smallest resemblance between this operation and what is exhibited by caterpillars, and many other insects. The skin is detached here and there, and often in different sized plates; and the change is slow, for it occupies one or two days, and I have even known it take three. During spoliation, the newt continues moving about in the water, with all the usual motions of newts that undergo none; therefore it is no disease, and it does not affect them as it does insects. While the change is going on, the animal darts on its prey, holds and devours it.

“ Sometimes spoliation is difficult to be accomplished; but, in these cases, the newt knows to practise certain manœuvres, to facilitate the operation, which I have often beheld with pleasure. It alternately raises and depresses the right arm and left leg at the same time, with gentle vibrations of the whole body. It frequently darts suddenly towards the surface of the water, and the next moment precipitates itself to the bottom; and these manœuvres I have seen continued above half an hour. But the sudden exertion, in all its motions, indicated that the newt was impatient at the tediousness of the change.

“ When most of the spoil is thrown off, and the animal, to disengage itself from the rest, rapidly rises to the surface, it seems carried along in a cloud; for the whiteness, fineness, and semitransparency of the spoil, floating around it, is no imperfect representation of a cloud.

“ I never observed the fingers employed in detaching the spoil. Both young newts and those full grown cast several successive skins: some of large size are in my possession, that have done so before me. Reproducing limbs throw off the epidermis as well as the original.

“ I have seen the skin of the head, which formed like a collar or cravat round the neck, gradually come down the belly of a large newt that had lost the arms, and fasten like a tight girdle.

“ Nothing can accurately be said of the number and interval of mutations. Between the 14th of July and the 7th of September, a newt has changed its skin 11 times.

1st change,	14th July.	6th change,	9th August.
2d	17th	7th	—
3d	20th	8th	19th
4th	24th	9th	24th
5th	30th	10th	26th
		11th	6th Sept.

* Spallanzani's *Tracts*, ii. 368. *Dal-yell's Trav.*

“ Spoliation sometimes makes a slight change in the colour.”*

Physiology. The manner in which toads throw off the old cuticle is quoted by Dr Shaw, as related by Mr Schneider, from Grignon, who was an eye witness of it. “ The skin splits or cracks in a longitudinal direction, both above and below, and the animal pulls off that of the left side with its left foot, and, delivering it into the right foot, applies it to its mouth and swallows it. It then performs the same process on the right side, and, delivering the cuticle into the left foot, swallows it like the former.”

But the most remarkable circumstance in the economy of these animals is the reproduction of mutilated limbs, such as the legs, the tail, and even the eyes. The completest set of experiments to ascertain these curious facts, were made by Spallanzani and Bonnet. The following is an account of some of these experiments in the words of the author.

“ EXPERIMENT. *The right arm and left leg of a newt amputated.*—On the 6th of June, I cut the right arm and left leg off a large newt, very near the body. A stream of florid blood spouted a minute and a half from each wound; however, the vessels soon closed, and the newt was apparently as well as those unamputated. But it will easily occur that it did not swim with equal facility.

“ When about a month had elapsed, I began to perceive a papilla, of a violet gray colour, near the edge of the trunk or section. This was the origin of a new arm and leg, which gradually increased; and, from the 14th of July, the two papillæ continued growing on the subsequent days, but more in length than thickness. They became minute stumps; and, on the first of August, were about two lines long. A kind of cleft, hardly perceptible, announces the appearance of two toes, which nature labours to produce, or rather to expand, on the new foot. No cleft appears on the originating arm.

“ The two toes were easily recognised on the 7th. They were real miniatures, and truly most minute. The stump of the arm continued nearly as it was on the first of the month, but is now somewhat larger; but as yet there is no indication of fingers.

“ It is pleasing to observe the little hand fully unfolding, while only three fingers of unequal length are visible: the middle one is the longest. The arm has made no sensible progress. The new foot had four toes also of unequal length, the first and second of which are longest; other two only begin to appear; the fourth is scarcely perceptible. One can never tire contemplating these miniatures, and admiring the wonders of the organic kingdom.

“ Evolution advanced every day. On the 22d of August, the regenerated members began to deepen in colour, so that the line, discriminating the old parts from the new, was no longer so conspicuous; but the black specks on the toes of unamputated newts were still imperceptible.

“ I continued my observations on the daily evolution of the members; and the following were their dimensions in length, on the 20th of September.

	<i>Old Members.</i>	<i>New Members.</i>	
Arm,	4 lines.	Arm,	2½
Cubit,	3½	Cubit,	2½
Thigh,	3	Thigh,	2½
		Leg,	

Phyiology.	Leg,	4	Leg,	2 $\frac{1}{4}$
	Longest finger,	3 $\frac{1}{2}$	Longest finger,	1 $\frac{1}{2}$
	Longest toe,	4 $\frac{1}{2}$	Longest toe,	1 $\frac{1}{2}$

It is this primitive state which we design by the word *Phyiology*; *germ*; and which we can comprehend, when the organic whole is expanded to a certain extent. But there is here a term beyond which we cannot ascend; for the organic whole either becomes so minute or so transparent, that it escapes all research and our most perfect instruments.

Even in the beginning of October, the fifth toe of the new foot was not visible.

“EXPERIMENT.—*A newt deprived of the right arm and left hand.* On the 12th of June, I cut the left hand and right arm off a newt: my chief object in this experiment was to verify Sig. Spallanzani’s assertion, that nature reproduces exactly the portion amputated, which was a fact of the utmost importance in the theory of animal reproductions, and could not be too well established.

“The dimensions of the old and new members, in length, were as follows, on the 2d of September.

<i>Old Members.</i>		<i>New Members.</i>	
Arm,	3 $\frac{1}{4}$ lines	Arm,	2 $\frac{1}{4}$
Cubit,	3 $\frac{1}{2}$	Cubit,	2 $\frac{1}{4}$
Longest finger,	1 $\frac{1}{2}$	Longest finger,	1 $\frac{1}{2}$ <i>Ibid.</i> ii. 372.

“Towards one side of the section, a little conical nipple began to appear about the 7th or 8th of July, of a violet gray colour. An incipient cleft, indistinctly seen with the naked eye, was perceptible near the middle of July: the papilla seemed ready to divide in two; and the cleft was the origin of two fingers.

“EXPERIMENT.—*The tail of a newt amputated transversely.* Something important would have been wanting, had I neglected amputation of the tail, which is a very intricate great organic substance. It is formed of a series of minute vertebræ, with arteries, veins, and nerves; and it is covered with muscles and flesh.

“In two or three days, I remarked a new cleft at the upper extremity of the papilla, which was the beginning of a new finger: the third, in its turn, appeared on the 19th. The conical papilla had then disappeared; and in its place was seen a small open hand with four fingers, still very minute, but quite well shaped.

“The tail of a large newt is more than two inches long, and about half an inch thick, formed like an oar, and terminated by a soft point. Much might be said of the figure, proportions, and position of this organ, and with respect to the functions it has to exercise; but these would be details foreign to any purpose: I only mean to confirm what Sig. Spallanzani has advanced concerning the admirable reproduction of the members.

“On the 3d of August, the cone began to divide, that is, two fingers became evident.

“On the 9th, a hand extremely minute, but the most beautiful object imaginable, was observed at the extremity of the arm. The fingers, all of unequal length, were distinguished, the smallest being just perceptible. The trunk, or part of the original arm, connected to the body, may be recognised by the brown colour, and from being covered with white points. The new arm is of a lighter and uniform colour. Four fingers of the hand are visible: the largest not above half a line in length.

“When the tails of large newts were amputated near the origin, I never succeeded in obtaining reproduction; the whole died in a certain time; and for several weeks preceding death, a kind of whitish cotton mould grew on the wounds, the filaments of which were several lines in length. Nevertheless, I cannot think that this affected the animal’s life, for I had seen similar mould, or cottony filaments, on wounds occasioned by amputating the arms and legs. These filaments gradually disappeared, and unequivocal signs of reproduction soon became visible. Thus a good observation was never obtained, unless the tail was divided about the middle, and by a section perpendicular to the axis. A stream of blood, as thick as a hog’s bristle, always spouted from the wound. The large vessel, from which it flows, is situated near the vertebræ, and its orifice is visible by the naked eye; it immediately closes; and the orifice is distinguished by a reddish or brownish point.

“The hand of the left arm had made considerable progress on the 21st: it had expanded, and nearly acquired the figure peculiar to the newt’s hand. The fingers also had extended, and become thicker in proportion. The whole hand began to colour, and brown specks were distinguishable on different parts; they were more evident on the back of the hand than on the fingers.

“The tail of newts is very sensible, which is particularly evident in the slenderest part. A portion cut off will retain life, and move whole hours; and when life seems entirely extinct, we have only to prick the pointed extremity, that motion may be renewed; it rises and falls alternately, and with greater force, according to the period that has elapsed since the operation. The motion of this separated part bears great resemblance to that which is peculiar to certain apodal worms; it is undulatory, and evidently depends on irritability, which is extremely active in so muscular an organ.

“On the 21st, the hand has already assumed its natural shape, and the rapid progress of evolution is suspended. Colouring of the arm begins near the trunk: but all the rest is of a mixed gray and violet colour.

“Though I have not hitherto expressly said so, it will obviously be presumed, that there is a kind of semi-transparency in the reproduced parts, which the original members have not. This continues long, and changes slowly as the reproductions colour. The transparency is evidently greater on the edges of the fingers than elsewhere; if examined with a magnifier, they seem inclosed in a fine diaphanous envelope: but nothing of this is evident in the old fingers. Parts beginning to unfold naturally have a degree of transparency wanting in those further advanced, or fully expanded, because, with the progress of evolution, the calibre of the vessels increases, which allows admission to more gross and colouring particles. Whiteness and transparency apparently constitute the primitive state of organic bodies.

“Immediately after the operation, the area of the cut exhibits a very long ellipse; the two extremities almost terminating in a point. The smallest diameter is about a line across, and the largest five or six. In the centre are the vertebræ, or blood-vessels; the rest of the area seems full of small oblong clear white substances,

Physiology. stances, which one would suppose pieces of fat, or glands. The surface slowly contracts; the opposite sides approach; the colour of the substances becomes fainter, and in a certain time, which is according to the season, new flesh appears, and it daily increases. Then we observe one or two cross brown lines, occupying the middle of the new tail, which indicate the site of the vertebræ and the vessels. In a tail which had been divided on the 11th of July; on the 14th of August the reproduced part was about three lines and a half long, and four and half in diameter, at the base.

Tail regenerated.

"The new portion was ten lines in length, 20th September, and shaped exactly like the tail of a newt. I could observe no difference between the motions of this regenerated tail, and those of tails unamputated. Those of the regenerated part only had a peculiar transparency, wanting in the rest of the tail.*

* *Ibid.* ii. 381.

"EXPERIMENT.—*Whether reproduced members possess the same sources of reproduction as those amputated.* I cut the left arm and right thigh off a large newt, 2d June 1778. In the beginning of July, a new arm and thigh began to reproduce. They were still in miniature, but the fingers and toes sufficiently formed, and very distinct.

"On the 11th of July, I made an experiment, which was most important in the theory of animal reproductions. The object was to discover whether the members now reproducing, which in reality were miniatures, contained the same sources of reparation as the original; that is, whether they were, in new limbs, germs containing members in miniature, similar to those amputated. With this view, I cut off the regenerated hand and foot.

"At the extremity of the reproduced leg, on the 21st, appeared two new toes extremely minute, but easily recognizable by the naked eye: and, on the 24th, an originating hand, with three well-shaped fingers, appeared at the extremity of the new arm.

"The foot, now reproduced, exhibited four very distinct toes. Both these and the fingers were yet only one fourth, or one-third, of a line long.

"Therefore it is proved, by this first experiment, that the reproduced limbs of a newt can make new productions, in the same manner as the old ones can, and give birth to members which, in their essential parts resemble those amputated, and are different only in size, consistence, and colour: for, as was remarked in my former memoir, the new members are of more delicate texture, and of a much lighter colour than the old.

"It was undoubtedly most interesting to ascertain how far the resources of nature extended; and whether, after several successive mutilations of the reproduced member, a new one would still regenerate.

"On the 31st of July, for the second time, I cut off the reproduced hand and foot of my newt; the fingers and toes being then about a line long.

"Two new fingers and toes appeared at the extremity of the limbs, 13th August, therefore, a hand and foot had begun to regenerate. On the 15th, there were three fingers and toes already well formed, though very small.

Reproduced members also regenerated

"Both the hand and foot seemed quite repaired on the 24th, though still of extreme minuteness. All the fingers had grown, but only four toes. And it may now be observed, that the appearance of the fifth toe is constantly later; often it does not unfold.

Physiology. "On the same day, 24th August, I amputated the reproduced hand and arm the third time; and on the 13th October, performed the fourth operation: the limbs being then in the same state as those mutilated by the third amputation.

"Thus it is fully established, that every member, successively reproduced, contains new sources of reparation; and that they are actually existing, though the member is extremely minute.

"From these successive mutilations of reproduced members, I have thought the extremity of the leg and arm became a little thicker than usual, as if from a reflux of the nutritive fluids into the extremity, by such repeated amputations.

"This season was particularly favourable to my experiments, being always dry and warm. A mercurial thermometer, in the shade, completely isolated, on a large terrace, stood at 90° and 93°, on the 14th and 15th of August. Most of summer it stood between 79° and 81°; and the temperature of the apartment, where the newt was kept, differed very little from that of the open air.

"EXPERIMENT.—When a large newt was treated as has just been related, I made another experiment on one of similar size, to obtain comparative results.

"The left arm and thigh were severed 2d June 1778. Reproduction of new members commenced in the beginning of July: two well shaped toes were then on the foot. On the 11th, new limbs had replaced the old; they seemed completely repaired: still they were only miniatures of most delicate texture. This day I amputated the reproduced hand and foot.

"A new foot, with two distinct toes, was perceptible on the 22d; and three were visible on the 24th. But the new hand had not appeared; at least there was no evidence of originating fingers. The thermometer now stood about 84°. However, a new hand, with three perfect fingers, was seen on the 29th.

"The reproduced hand and foot being a full line long on the 31st, I then cut them off. Both appeared again, August 15th, with three well shaped fingers and toes. On the 24th, the hand had acquired its four fingers, and the foot five toes, all visible, though excessively small.

"I then cut off the hand and foot for the third time. The fingers and toes were a full line long 13th October; four of each appeared, but the fifth toe was yet imperceptible.

"Next I performed a fourth amputation: it also was followed by reproductions. Various occupations having interrupted me, a fifth amputation was not made before 26th August 1779.

"The longest finger was then about one line and a third, the longest toe one and a half in length, deep coloured, and very slender. The hand had four fingers; the first and fourth imperfect. The foot had only three toes, more distant from each other than usual. Both the fingers were as imperfect 30th October 1780: the fourth scarcely visible, and consisting only of a sharp point; and no more than three toes on the foot. The newt had then diminished greatly in size, and was very brown. It ate little, and seldom: it remained long at the surface, unable to get to the bottom of the water; and its belly was almost always very much inflated.

"These are two experiments, therefore, which concur

Physiology in establishing the same fact, viz. that the reproduced members of a newt, though still in miniature, are equally provided with reparatory germs as the old limbs; and that they begin to unfold after the new members are cut off.*

* *Ibid.* ii.
394.

To these curious experiments we shall only add the account of another, concerning the reproduction of the eyes of newts.

“*EXPERIMENT.—On the eyes of newts.* This is a cruel experiment; and sensible minds will hardly pardon the observer’s cruelty, though it arises from an evident desire to discover new facts and enlarge our knowledge of the animal economy. Therefore, I fear the compassionate reader will revolt further still at what is yet to be related. But I beg he will consider, that animals, which, after losing one, or even several limbs, continue greedily devouring the prey presented, undoubtedly cannot experience the sensation of pain to the excess which our own sensations lead us to imagine. We are very insufficient judges of what passes within an animal so remote from us in the scale of living beings. Let it not be thought, that by these reflections, I mean to lessen the natural repugnance of every humane mind to make animals suffer. The benignity of nature itself will inspire man with this precious sentiment to prevent the enormous abuse that his power might exert over the animals which she has subjected to his dominion. Yet let me ask, whether a rational person abuses his empire over animals, by making them suffer only for his own instruction, or that of his fellow creatures.

“With a scalpel, I extracted the right eye of a large newt, September 13. 1779; but I did not obtain the globe without much injury to the tunics. It was the first time of performing the operation, and before I had acquired the peculiar dexterity necessary for success, and afterwards learned by experience. Thus the utmost disorder ensued in the eye, and the crystalline lens started out on my nail. This is a beautiful object; no larger than a millet seed, and quite transparent. I thought that I beheld one of the spherical lenses with which Leeuwenhoek discovered so many wonders. But contact of the air soon tarnished the minute lens; it dried and became disfigured.

“A deep bloody wound in the socket of the eye was the consequence of this cruel operation. And the reader will not be surprised if I hardly expected any thing from it, and that the newt would probably remain blind for ever. How great was my astonishment, therefore, when, on the 31st of May 1780, I saw a new eye formed by nature. The iris and cornea were already well shaped, but the latter wanted its peculiar transparency, which is very considerable in these animals. Impatience to arrive at the most important part of the prodigy has induced me to omit the progress of it; and observe that nature certainly began with closing the wound.

Eyes regenerated.

“The eye was completely repaired 1st September. The cornea was nearly as transparent as that of the other eye, with which it was frequently compared. The iris had also acquired the yellow gilded colour, which characterises this species of newt. In short, the eye was so perfectly renewed, that no vestige existed of the uncommon operation that the animal had undergone. During the remainder of this and the following month, the cornea always became more transparent; and now,

when I write these remarks, 8th November 1780, it is equally perfect as the other; but the reproduced eye seems a little smaller than the entire one; and the iris, or golden circle, goes only half round the ball.

“It would still be necessary to extract the reproduced eye, to ascertain, by dissection, whether it contains a crystalline lens similar to the original. But I confess, that, as yet, I have not had resolution to subject the newt to the most barbarous of all operations; and I shall probably await its death for satisfying my curiosity.”*

*HYBERNATION OR TORPIDITY OF REPTILES.—*The heat of the atmosphere is necessary to animals, that when the periodical return of the seasons reduces the heat of the countries in the neighbourhood of the equator to the cool temperatures of places situated in higher latitudes, reptiles lose their activity; the heat of their blood diminishes; their strength decreases; they retire into obscure retreats, in holes of rocks, in the mud at the bottom of lakes, or else they seek shelter among the roots of plants which grow on the banks of rivers: but the cold increasing, they fall into a state like that of profound sleep; and this torpor is so great, that no noise disturbs or awakens them. They seem alike insensible to violent blows or severe wounds. Reptiles are subject to this state of torpidity only in those countries where the variations of temperature at different seasons of the year is considerable; and indeed it seems to be a wise regulation of nature, that some of the animals functions should be suspended during that period of the year when the supply of food is cut off. This is the case with reptiles which inhabit countries distant from the equator, whose food consisting of insects, worms, &c. can only be obtained in the warmer season of the year. Accordingly, about the end of autumn, the reptiles which have been vigorous and active in the summer, conceal themselves in the earth, or under the water, where they remain in the torpid state till the return of the genial warmth of spring. In Britain, frogs are found at the bottom of stagnant water, or in marshy places, where the water of springs issues from the earth, the temperature of which continues uniform through the whole year.

In this state of torpor and inaction, nothing of the animal remains but the form, and those functions only go on, which are essentially necessary to existence during this long period of torpidity, which sometimes continues more than six months. The total mass of the body of reptiles sustains only small loss of substance, but the external parts, such as are exposed to the action of the cold, and more distant from the centre of heat, undergo in the most of animals a considerable change.

But even in countries where the change of seasons is so great, and the diminution of temperature such as to oblige the animals belonging to this order to retire during that season, there are in particular circumstances some remarkable exceptions. One of these is mentioned by Townson in his Travels in Hungary. “The town of Gran (he says) is favoured with a fine spring of tepid water, of more use, I believe, to the frogs than to its other inhabitants. My Ciceroni assured me that this animal is not torpid here during the winter, but is then seen in numbers in the pond in the town which receives its water from this spring. This is uncommon (continues the same author), but not surprising. For these
three

* *Ibid.* iii.
431.

Places to which they retire in winter.

Physiology. three years, I have kept a favourite tree frog, which is as gay in winter as in summer, provided she has warmth and enough to eat. The German stoves, which keep the room warm all night, have been very favourable to her. In this, hybernation differs from sleep, that, whereas the latter admits of little variation, and can never be laid aside, or through art receive a substitute; the former greatly varies, and may be supplied by warmth and food. The Alpine marmot, in some high vallies in Savoy hybernates, I am told, eight or ten months in the year. In other parts of the Alps, it does not hybernate half that time; and when kept warm, and well fed, its annual sleep entirely forfakes it, but not its diurnal. The same warmth that keeps alive the frog, keeps alive the insects on which it feeds, which in their turn will find food from the vegetable world, the mediate or immediate support of every living being kept in vegetation by the same cause*.”

* p. 60.

Abstinence of the crocodile and the turtle.

ABSTINENCE OF REPTILES.—The singular instances of abstinence which have been recorded of many of the animals belonging to this order, are not the least of the peculiarities by which they are distinguished. It is conjectured by some physiologists, that the texture of the skin, which has few pores, and from which consequently the waste by perspiration is very small, enables them to endure long abstinence. The turtle and the crocodile can live two months without any kind of nourishment. It is no unusual circumstance to keep turtle on the decks of ships, during a passage of seven or eight weeks, from the West Indies, without any food whatever, only occasionally moistening the eyes with salt water.

Of the toad. The toad has lived eighteen months entirely deprived of food, and excluded from the air; so that the functions of digestion and respiration, so necessary and essential to animal existence in general, must have been totally suspended. We have already mentioned, in the natural history of the toad, Herissant's experiments on this subject before the French academy; and it would be superfluous to repeat the account of them here.

In the same place we have also given our opinion of the extreme improbability of toads, or indeed, it may be added, any animal whatever, having existed for any length of time inclosed in wood or stone, according to the vague stories which have been propagated of such having been discovered. The experiments of Herissant, above alluded to, afford a direct proof of the contrary.

TENACITY OF LIFE.—Many of the tribes of reptiles are not less remarkable for being extremely tenacious of life. They not only live when deprived of their limbs and are otherwise mutilated, but absolutely seem to be little injured when some of the organs essential to life in other animals, and without which they could not exist for a moment, have been removed. The experiments of Redi on the land tortoise, which we have related in the natural history of that animal, in p. 271. are a proof of this fact.

AGE OF REPTILES.—Of the age of reptiles not much is known. But, from the few well-authenticated instances which are recorded, it may be fairly presumed, that the period of the life of many tribes is very long. This, indeed, might have been concluded to be the case with cold-blooded animals, which can sustain total abstinence for such a length of time, are so

extremely tenacious of life, and repair so easily the loss of different parts of the body: but, on the other hand, when it is considered that they have no fixed haunts where they can remain always undisturbed, that from their amphibious nature they live alternately on the land and in the water, and that they are constantly exposed to the vicissitudes of the seasons, it is not possible to conceive but these changes from wet to dry, and from hot to cold, must greatly affect the animal frame, and limit the period of existence.

But without entering into any train of reasoning on the subject, the facts which have been recorded, and some of which we have related, clearly shew, that individuals among reptiles arrive at a very great age. The age of the land tortoise which was kept in Lambeth gardens, and which we have mentioned in p. 271. was at least 120 years. The common toad, of which the history of one kept by Mr Ascot in Devonshire, that lived to the age of 40 years, is given in p. 286. is an instance of the remarkable length of life of so small an animal.

Some species of the turtle do not reach their full size till they are 20 years old; and it is said that they live more than a century.

The age of the crocodile can only be conjectured. It is supposed that this animal, which does not reach its full size of 25 feet long in less time than 32 years, may live seven times this period, so that the age of the crocodile has been calculated at 200 years.

MANNERS, &c. OF REPTILES.—There are probably few animals which discover so much tranquillity and composure in their manners and habits, in general, as reptiles. Less agitated within by violent passions, and less affected from external objects than other animals, they are calm, mild, and peaceable. And if the crocodile, which of all the animals belonging to this order is the most voracious and destructive, is to be regarded as an exception, the ferocious habits for which he is distinguished, are owing to the great size of body which he must support; and, besides, how many tribes may be opposed to this sanguinary family, whose character is quite the reverse. Let us only compare the character of the crocodile with the gentle habits of the small gray lizard, or with the manners of the frog.

But notwithstanding this favourable character of reptiles, which may be considered in some measure as negative, it is to be observed, that, in their manners and habits, they never discover that choice of means, that series of combinations, or that kind of foresight, which in many other animals we behold with wonder and admiration. If sometimes they assemble together in great numbers, this by no means exhibits the character of that social union which takes place among gregarious animals, for it discovers no foresight or order. This bond of union is founded on no connection with each other, on providing no means for their mutual safety or protection. They produce no common work; they do not join together in search of prey, nor are they united in making any general attack on their enemies. Like the beaver, birds, or bees, they construct no permanent asylum; but when they fix on any particular place of abode on the shores, in the clefts of rocks, or in the hollow of trees, it is not a commodious habitation which they prepare for a certain number of individuals, and which they endeavour to appropriate to different purposes,

Physiology. purposes, it is rather a retreat for concealment on which they make no change, and which they occupy equally, whether it be only sufficient for a single individual, or contain an extent of space to admit many. If they associate together, it has been observed, for the purpose of pursuing their prey either on the land or in the water, it is because they are equally attracted by the same object; if they make a joint attack, it is because they have the same prey in view. If they seem to unite for the common defence, it is because they are attacked at the same time; and if any individual among them has ever saved the whole party, by warning it by its cries, it is not as has been said of monkeys and some other quadrupeds, that they have been left to watch for the common safety, but only proceeds from the impressions of fear which every animal possesses, and which renders it constantly attentive to its own preservation.

It has been commonly supposed that reptiles have none of those tender affections, with which the care for the preservation of their offspring inspires other animals. Their whole concern about their progeny, it is thought, extends no farther than depositing their eggs in proper places, and covering them with sand and leaves. The offspring is not indebted to the parent for its food, for any of its habits, or for assistance or protection of any kind. It is true, that in general, the moral affections owe much of their force to the repeated impressions on the senses, and that these impressions, recurring distinctly to the memory, and modified by the imagination, cherish these feelings; whence it follows, that the females of reptiles, which do not hatch their young, and which never see them till after the process of incubation is completed, must have very feeble impressions of maternal tenderness, or perhaps none at all. The few observations, however, which have been made with regard to the attachment of the crocodile to its offspring, shew that some of them are not entirely destitute of that feeling, which almost universally pervades the animated creation. "At Surinam (says M. de la Borde) the female of the crocodile remains always at a certain distance from her eggs, which she watches and protects with a kind of fury when any animal approaches them. On the banks of the Oroonoko, when the alligators are hatched, the mother places them on her back and returns to the river. "But, adds Gummilla, the male eats as many as he can, and the female herself devours all those which separate from her, or which are unable to follow her; so that scarcely five or six, of the whole number, remain." This fact, which is by no means probable, even in so voracious an animal as the crocodile, is not incompatible with what is certainly known of many other animals devouring their own offspring. But it seems extremely doubtful, that what is mentioned above of the crocodile watching its eggs, as recorded by de la Borde, is an observation founded in truth.

ENEMIES OF REPTILES.—The earth would soon be covered with immense swarms of reptiles, if nature had not made some provision to retard their increase, and raised up a crowd of enemies which destroy their eggs and their offspring, and preserve the proper balance

which is established among the different orders of animals. Fortunately, a great number of frogs, toads, lizards, and crocodiles are destroyed before they are hatched. Many quadrupeds, as several species of monkeys, the ichneumon, and other animals, as well as several species of aquatic birds, search for their eggs on the shores, and feed on them with avidity. All the small reptiles, which live in the water, which crawl in the mud of marshes, or creep on the earth, become the prey of fishes, of serpents, of birds, and of quadrupeds.

The tiger attacks the crocodile, and is sometimes successful in seizing its prey. The hippopotamus is a terrible enemy to the same animal; and is the more to be dreaded, as from his habits, he is enabled to pursue it to the bottom of the water. The cougar, although a less ferocious animal than the tiger, destroys many alligators. He waits in ambush on the banks of the great rivers for the approach of the young ones, and at the moment they raise their head above the water, he seizes them and tears them to pieces. But when he attacks those that are large and vigorous, he often meets with a bold and effectual resistance. It is in vain that he fastens his talons in their eyes; these huge reptiles drag him to the bottom of the water and devour him.

But man is perhaps the most dangerous enemy of the crocodile; sometimes he attacks him by open force, and sometimes by means of stratagem. The Africans, as soon as they perceive one of these animals on the bank of a river advance towards him, having only in their hand a stick of very hard wood, or an iron rod about eight or ten inches long, and well sharpened at the ends; they hold this feeble instrument by the middle, and when the reptile, which advances towards them, opens his wide mouth, they introduce the rod of iron, which they turn with dexterity, so that the monster finds that he is unable to close his jaws. The pain from the wound, and instinct to reach a place of safety, make him retreat into the water, where he soon perishes by suffocation and the loss of blood. It is said, that some negroes are so bold and dexterous, as to swim under the body of the crocodile, and to pierce him in the skin of the belly; which is almost the only place on which a wound can be inflicted.

In some countries the natives employ stratagem to take this dreaded animal. In Egypt, they dig a deep ditch in the path which he follows in proceeding from the river. This is covered with branches of trees, and with a small quantity of earth; they then set up loud shouts, at which the crocodile is terrified, and returning the same way to the water, he passes over the ditch, falls into it, and is either killed or taken in snares.

The Indians successfully employ another mode of destroying the crocodile. They introduce into the body of a small animal, newly killed, a quantity of arsenic or quicklime, so secured, that the moisture cannot reach it; and this animal is exposed to the view of the crocodile. This is undoubtedly the most certain, and the least dangerous expedient.

EXPLANATION of PLATES.

Plate CCVII.

- Fig. 1. Testudo Græca, *Common land Tortoise*, page 270.
 Fig. 2. Testudo Mydas, *Green Turtle*, page 278.
 Fig. 3. Rana Esculentia, *Green or Eatable Frog*, page 281.
 Fig. 4. Rana Arborea, *Tree Frog*, page 284.
 Fig. 5. Rana Pipa, *Surinam Toad*, female, page 288.
 Fig. 6. Draco Volans, *Flying Dragon*, page 289.

Plate CCVIII.

- Fig. 7. Lacerta Crocodilus, *Common Crocodile*, page 290.

- Fig. 8. Lacerta Alligator, *Alligator or American Crocodile*, page 291.
 Fig. 9. The Young Alligator proceeding from the egg.
 Fig. 10. Lacerta Chamæleon, *Common Chameleon*, page 300.
 Fig. 11. Lacerta Salamandra, *Salamander*, page 303.

Plate CCIX.

- Fig. 12. Skeleton of the Turtle.
 Fig. 13. Skeleton of the Frog.
 Fig. 14. Skeleton of the Crocodile.
 Fig. 15. Skeleton of the Gray Lizard.
 Fig. 16. Skeleton of the Chameleon.

I N D E X.

- | | | | | | |
|--|--|------------|---|------------|---|
| A | | | | | |
| ABDOMEN, | | p. 308 | <i>Chameleon</i> , errors concerning this change, and its abstinence, | p. 300 | <i>Fft</i> , division of, |
| <i>Abstinence</i> of reptiles, of the toad, | | 320 | <i>Characters</i> , generic, | 269 | <i>Eggs</i> , size of, |
| <i>Age</i> of reptiles, toad and tortoise, turtle, crocodile, | | <i>ib.</i> | <i>Circulation</i> of the blood in reptiles, its peculiarity, | 311 | coverings, |
| <i>Alligator</i> , | | 291 | <i>Classification</i> of different naturalists, | 269 | of turtle used as food, |
| history of, by Catesby, | | <i>ib.</i> | <i>Common</i> frog, | 281 | of alligator also as food, |
| history of, by Ulloa, | | <i>ib.</i> | history of, | <i>ib.</i> | <i>Enemies</i> of reptiles, |
| <i>Anatomy</i> of reptiles, | | 306 | <i>Cordyles</i> , division of, lizard, | 297 | <i>Erpetology</i> , introduction to, study of, important, |
| <i>Anus</i> , | | 308 | <i>Crocodile</i> , common, history of, | 290 | <i>Expiration</i> , process of, |
| includes the parts of generation, | | <i>ib.</i> | less formidable than represented, | 291 | <i>Eyes</i> of reptiles, |
| <i>Apodal</i> lizard, | | 305 | hunted with dogs, | <i>ib.</i> | newts regenerated, |
| <i>Arms</i> of newt regenerated, | | 316 | kept by the African monarchs, | <i>ib.</i> | |
| B | | | exhibited by the Romans, | <i>ib.</i> | F |
| <i>Basilisk</i> , species of lizard, error concerning, | | 295 | American, or alligator, history of, | <i>ib.</i> | <i>Feet</i> of reptiles resemble those of quadrupeds, |
| <i>Biped</i> lizard, | | 305 | Gangetic or Indian, | 291 | are furnished with toes, |
| <i>Breeding</i> time of frog, turtle, alligator, | | 313 | | | bones of, |
| | | 314 | | | <i>Frog</i> , common, |
| <i>Bull</i> frog, | | 282 | | | history and changes of, |
| singular for the sound of its voice, | | <i>ib.</i> | | | tadpole, the larva of, |
| popular notion of, | | <i>ib.</i> | | | structure of, |
| C | | | | | food of, |
| <i>Calipash</i> of the turtle, | | 308 | | | green, or eatable, |
| <i>Calispee</i> , | | <i>ib.</i> | | | employed as food, |
| <i>Chalcides</i> lizards, annulated, | | 305 | | | bull, |
| | | <i>ib.</i> | | | remarkable for the sounds it emits, |
| <i>Chameleon</i> , division of, history of, tongue, structure of, peculiar, changes of colour, | | 300 | | | popular notion of, in America, |
| | | <i>ib.</i> | | | paradoxical, |
| | | <i>ib.</i> | | | tadpole, singular appearance of, |
| | | <i>ib.</i> | | | tree, |
| | | <i>ib.</i> | | | peculiar structure and economy, |
| | | <i>ib.</i> | | | changes on, and habits of, in breeding season, |
| | | <i>ib.</i> | | | ova, description of, |
| | | <i>ib.</i> | | | |
| | | <i>ib.</i> | | | G |
| | | <i>ib.</i> | | | <i>Galeot</i> lizard, |
| | | <i>ib.</i> | | | 295 |
| | | <i>ib.</i> | | | <i>Galeot</i> , |
| | | <i>ib.</i> | | | |

Fig. 1.



Fig. 2.

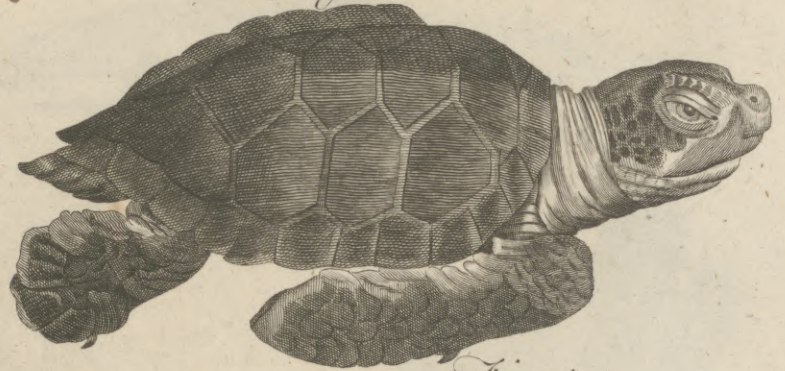


Fig. 3.



Fig. 4.



Fig. 5.



Fig. 6.



Fig. 7.



Fig. 8.



Fig. 9.



Fig. 11.



Fig. 10.



Fig. 12.

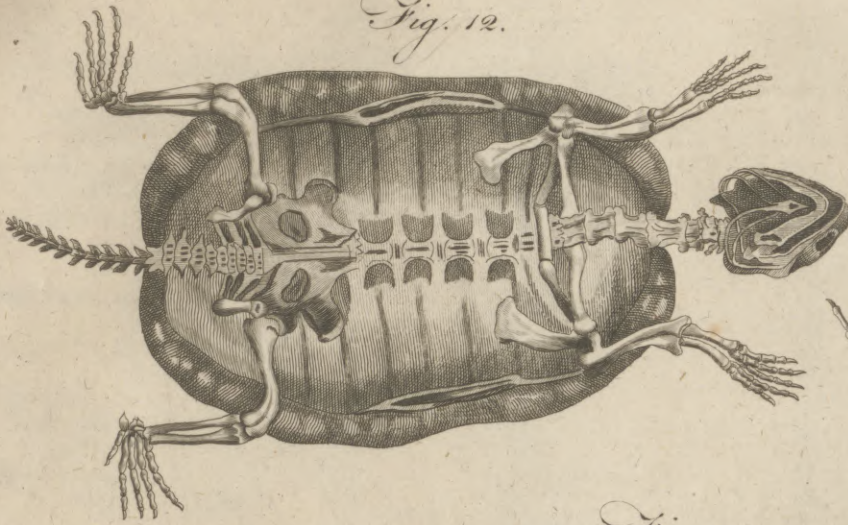


Fig. 13.



Fig. 14.

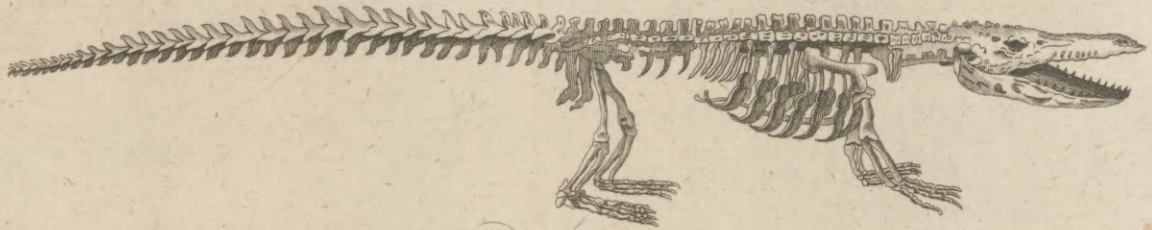
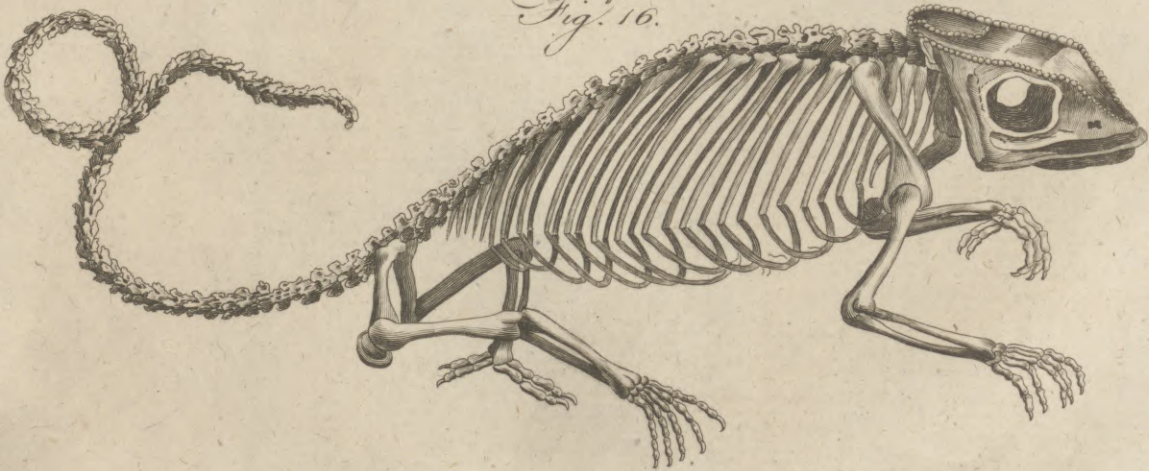
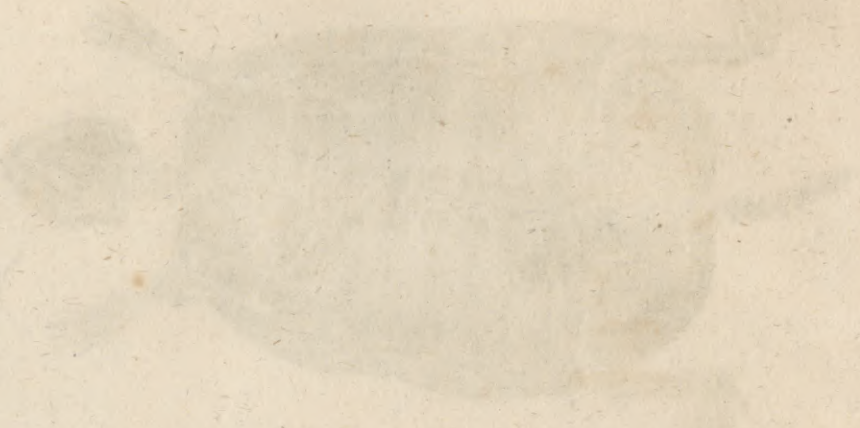


Fig. 15.



Fig. 16.





- Rana* meriana, p. 285
 aurantia, *ib.*
 tinctoria, *ib.*
 alba, *ib.*
 bilineata, *ib.*
 bufo, 286
 alliacea, 287
 mephitica, *ib.*
 viridis, *ib.*
 marina, *ib.*
 dubia, *ib.*
 typhonia, *ib.*
 braziliana, 288
 ventricosa, *ib.*
 corauta, *ib.*
 pipa, *ib.*
 breviceps, *ib.*
 sylvatica, *ib.*
 acephala, 289
 lentiginosa, *ib.*
 femilunata, *ib.*
 melanosticta, *ib.*
 arunca, *ib.*
 lutea, *ib.*
 Reproduced members regenerated, 318
 Reproductive power of reptiles, 315
 Reptile properly applied to these animals, 268
 Reptiles, anatomy of, 306
 have not all teeth, 307
 classification, 269
 generic characters, *ib.*
 abstinence of, 320
 the toad, *ib.*
 food of, 315
 are extremely voracious, *ib.*
 habits in watching for prey, *ib.*
 character of, in different situations, *ib.*
 none but lizards in Kamtschatka, *ib.*
 superstition of the natives concerning, *ib.*
 abode, *ib.*
 reproductive power of, *ib.*
 enemies of, 321
 Respiration, process of, 311
 inspiration, *ib.*
 expiration, 312
 mechanism, *ib.*
 Ribs, 308
- S
- Salamander*, division of, 303
 history of, *ib.*
 is viviparous, 304
 popular errors concerning, *ib.*
Scapula, 309
Scinks, division of, 302
 history of, *ib.*
Serpent lizard, 305
Skin of reptiles renovated, 315
 history and progress of, *ib.*
Snake lizards, division of, 305
 history of, *ib.*
Species, number of, in the order, 306
- T
- Tadpole*, p. 281
 history of, *ib.*
 structure and changes of, *ib.*
 singular one, 284
 changes and evolution of, 313
Tail of reptiles, 308
 not in all, *ib.*
 of newt regenerated, 317
Tesludo, classification of, 270
 from number of claws
 insufficient, *ib.*
 into land and sea tortoises, *ib.*
 græca, *ib.*
 marginata, 272
 geometrica, *ib.*
 radiata, 273
 indica, *ib.*
 rugosa, *ib.*
 europea, *ib.*
 lutaria, *ib.*
 carinata, 274
 carolina, *ib.*
 fulcata, *ib.*
 tabulata, *ib.*
 concentrica, 275
 picta, *ib.*
 guttata, *ib.*
 elegans, *ib.*
 areolata, *ib.*
 ferrata, *ib.*
 pusilla, *ib.*
 tricarinata, *ib.*
 scabra, 276
 scripta, *ib.*
 galeata, *ib.*
 denticulata, *ib.*
 pennsylvanica, *ib.*
 longicollis, *ib.*
 caspica, *ib.*
 ferox, *ib.*
 granulata, 277
 fimbriata, *ib.*
 serpentina, *ib.*
 squamata, *ib.*
 coriacea, *ib.*
 mydas, 278
 caretta, 279
 imbricata, *ib.*
Toad, common, 285
 history of, *ib.*
 age, 286
 not poisonous, *ib.*
 error concerning, *ib.*
 alliaceous, *ib.*
 emits a peculiar smell, *ib.*
 tadpole of, voracious, 287
 used as food, *ib.*
 Surinam, 288
 economy of, in hatching ova, *ib.*
 casts its skin, 316
Tongue, an instrument for seizing the prey, 307
- Tongue*, error supposing the crocodile has none, p. 307
 structure of the chameleon, *ib.*
Torpidity of reptiles, 319
Tortoise, common land, 270
 description of, *ib.*
 native country, *ib.*
 great age, *ib.*
 tenacious of life, 271
 abstinence, *ib.*
 history of one, *ib.*
 marginated, 272
 geometrica, *ib.*
 terrapin of Dampier, 273
 radiated, *ib.*
 Indian, *ib.*
 wrinkled, *ib.*
 speckled, *ib.*
 employed as food, *ib.*
 mud, *ib.*
 carinated, 274
 close, *ib.*
 peculiar structure of, *ib.*
 of prodigious strength, *ib.*
 fulcated, *ib.*
 tabular, *ib.*
 concentric, 275
 is a delicate food, *ib.*
 painted, *ib.*
 spotted, *ib.*
 elegant, *ib.*
 areolated, *ib.*
 ferrated, *ib.*
 little, *ib.*
 tricarinated, *ib.*
 rough, 276
 lettered, *ib.*
 galeated, *ib.*
 denticulated, *ib.*
 pennsylvanian, *ib.*
 long-necked, *ib.*
 Calpian, *ib.*
 fierce, *ib.*
 shagreened, 277
 fimbriated, *ib.*
 snake, *ib.*
 scaly, *ib.*
 shell got from the hawk/bill turtle, 280
 mode of obtaining and preparing, *ib.*
 employed as ornaments by the Greeks and Romans, *ib.*
 an article of trade, *ib.*
Townson, Dr, on respiration, 311
 illustration or proof, 312
Tree-frog, 284
 peculiar structure and economy, 285
Trunk of the body, 307
Turtle distinguished from tortoises, 277
 coriaceous, *ib.*
 prodigious size of, 278
Turtle,

<i>Turtle</i> , green,	p. 278	<i>Turtle</i> , loggerhead, yields lamp oil,	p. 279	<i>Turtle</i> , hawkbill, trade with the Egyptianians,	p. 280
most commonly eaten,	<i>ib.</i>	very strong and fierce,	<i>ib.</i>	and to China,	<i>ib.</i>
a very delicious food,	<i>ib.</i>	hawkbill, or imbricated,	<i>ib.</i>	green-shelled,	<i>ib.</i>
mode of taking,	<i>ib.</i>	yields tortoise shell,	280	trunk,	<i>ib.</i>
eggs deposited in the land,	<i>ib.</i>	mode of obtaining it,	<i>ib.</i>	rhinoceros,	<i>ib.</i>
hatched by the sun,	279	process of its preparation,	<i>ib.</i>	breeding season of,	314
introduced into Europe,	<i>ib.</i>	used by the Greeks and Romans for ornaments,	<i>ib.</i>	varies according to circumstances,	<i>ib.</i>
loggerhead, a large species,	<i>ib.</i>				
flesh coarse and rank,	<i>ib.</i>				

E R R

ERRATIC, in general, something that wanders, or is not regular: hence it is the planets are called *erratic stars*.

ERRHINES, in *Pharmacy*, medicines which when snuffed up the nose promote a discharge of mucus from that part. See *MATERIA MEDICA Index*.

Errhines prepared of cephalic herbs are of singular service in oppressive pains of the head, a hemicrania, lethargic disorders, weakness of memory, stuffings of the head, and coryza, mucous defluxions of the eyes, drowiness, vertiges, and in cases where the malignant humours generated by the lues venerea are lodged in the membranes of the nostrils.

ERROR, in *Philosophy*, a mistake of our judgment, giving assent to that which is not true.

Mr Locke reduces the causes of error to these four; first, want of proofs; secondly, want of ability to use them; thirdly, want of will to use them; and, fourthly, wrong measures of probability.

He observes upon the first of these causes of error, that the greatest part of mankind want conveniences and opportunities of making experiments and observations themselves, or of collecting the testimony of others, being prevented by the necessity of their condition. Upon the second of these causes, he observes, that there are many, who, from the state of their condition, might bestow time in collecting proofs, but yet are not able to carry a train of consequences in their heads, nor weigh exactly the preponderancy of contrary proofs and testimonies, merely from the difference in men's understandings, apprehensions and reasonings. Thirdly, he remarks, that though some have opportunities and leisure enough, and want neither parts, learning, nor other helps, that they never come to the knowledge of several truths within their reach, either upon account of their attachment to pleasure or business; or otherwise because of their laziness or aversion to study. The fourth cause of error, viz. wrong measures of probability, he imputes, 1. To the practice of taking for principles propositions that are not in themselves certain and evident, but, on the contrary, doubtful and false. 2. To received hypotheses. 3. To predominant passions or inclinations. And, 4. To authority, or the giving up our assent to the common received opinions either of their friends or party, neighbours or country.

The causes of error in philosophy, or the reasons why all former philosophers have through so many ages erred, according to Lord Bacon, are these following.

E R U

1. Want of time suited to learning. 2. The little labour bestowed upon natural philosophy. 3. Few entirely addicted to natural philosophy. 4. The end of the sciences wrong fixed. 5. A wrong way chosen. 6. The neglect of experiments. 7. Regard to antiquity and authority. 8. Admiration of the works in use. 9. The artifice of teachers and writers in the sciences. 10. Ostentatious promises of the moderns. 11. Want of proposing worthy tasks. 12. Superstition and zeal being opposite to natural philosophy, as thinking philosophy dangerous, on account of the school theology; from the opinion that deep natural inquiries should subvert religion. 13. Schools and academies proving unfavourable to philosophy. 14. Want of rewards. And, 15. Despair, and the supposition of impossibility.

ERROR Loci. Boerhaave is said to have introduced the term, from the opinion that the vessels were of different sizes for the circulation of blood, serum, and lymph; and that when the larger-sized globules were forced into the lesser vessels by an error of place, they were obstructed. But this opinion does not seem well grounded.

ERUCA, in general, denotes caterpillars of all kinds.

The caterpillar state is that through which insects pass before they arrive at perfection. See *LARVA ENTOMOLOGY Index*.

ERUDITION, denotes learning or knowledge; and chiefly that of history and antiquity, of languages and of books, which is the result of hard study and extensive reading. The Scaligers were men of deep erudition: the writings of M. Launoy, a priest of the Oratory, are full of erudition.

Mr Locke says, it is of more use to fill the head with reflections than with points of erudition. If the mind be not just and right, ignorance is better than erudition, which only produces confusion and obscurity. M. Balzac calls a heap of ill-chosen erudition the luggage of antiquity.

ERUPTION, in *Medicine*, a sudden and copious excretion of humours, as pus or blood: it signifies also the same with exanthema, any breaking out, as the pustules of the plague, small-pox, measles, &c.

ERUPTION of Volcanoes. See *ÆTNA*, *VESUVIUS*, *VOLCANO*, &c.

ERVUM, the *LENTIL*: A genus of plants, belonging to the diadelphia class; and in the natural method ranking under the 32d order, *Papilionaceæ*. See *BOTANY Index*.

ERYMANTHUS,

Erratic
||
Error.

Error
||
Ersum

Eryman-
thus
||
Eryx.

ERYMANTHUS, a mountain, river, and town of Arcadia, where Hercules killed a prodigious boar, which he carried on his shoulders to Eurytheus; who was so terrified at the fight, that he hid himself in a brazen vessel.

ERYNGIUM, SEA-HOLLY, or *Eryngo*: A genus of plants, belonging to the pentandria class; and in the natural method ranking under the 45th order, *Umbellatae*. See *BOTANY Index*.

ERYSIMUM, HEDGE-MUSTARD: A genus of plants, belonging to the tetradynamia class, and in the natural method ranking under the 29th order, *Siliquosae*. See *BOTANY Index*.

ERYSIPELAS, in *Medicine*, an eruption of a fiery or acrid humour, from which no part of the body is exempted, though it chiefly attacks the face. See *MEDICINE Index*.

ERYTHEA, or **ERYTHIA**, an island adjoining, according to the ancients, either to or a part of Gades; nowhere now to be found by the description given of it by ancient authors. The poets feign this to be the habitation of the fabulous Geryon, disarmed by Hercules, who drove away his cattle.

ERYTHRÆ, in *Ancient Geography*, a port-town of Ætolia, on the Corinthian bay. Another Erythræ of Bœotia, near Plataea and Mount Cithæron. A third Erythræ, a town of Ionia in the Hither Asia, situated in the peninsula, at its extremity, with a cognominal port. The Erythræans laid claim to the Sibyl Herophile, as their countrywoman, surnamed thence *Erythræa*. Erythræ was famous for an ancient temple of Hercules.

ERYTHRÆA, a town of Crete, situated in the south-east of the island, at the promontory Erythræum.

ERYTHRÆUM MARE, erroneously called *Rubrum* by the Romans. Thus the ocean that washes Arabia and Persia, and extends a great way farther, is denominated. Hence it is, Herodotus says, that the Euphrates and Tigris fall into the Mare Erythræum. He also calls it the *South Sea*, on which the Persians dwell. It takes its name, not from its colour, the error of the Romans, who translated *Erythræum* "Rubrum;" but from *Erythras*, son of Perseus and Andromeda, whose kingdom lay on the confines of that sea; whence its name *Erythræum*.

ERYTHRINA, CORAL TREE: A genus of plants, belonging to the diadelphia class; and in the natural method ranking under 32d order, *Papilionaceae*. See *BOTANY Index*.

ERYTHRINUS, in *Ichthyology*, a species of SPARUS. See *ICHTHOLOGY Index*.

ERYTHROIDES, in *Anatomy*, the first of the proper tunics or coats which cover the testicles.

ERYTHRONIUM, DOG'S-TOOTH VIOLET: A genus of plants, belonging to the hexandria class; and in the natural method ranking under the 11th order, *Sarmentaceae*. See *BOTANY Index*.

ERYTHROXYLON, a genus of plants, belonging to the decandria class. See *BOTANY Index*.

ERYX, a son of Butes and Venus, who relying upon his strength, challenged all strangers to fight with him in the combat of the cestus. Hercules accepted his challenge after many had yielded to his superior dexterity; and Eryx was killed in the combat, and buried on the mountain, where he had built a temple to Venus. Virg. *Æn.* 5. v. 402. A mountain of Sicily

near Drepanum, which received its name from Eryx, who was buried there. This mountain was so steep, that the houses which were built upon it seemed every moment ready to fall. Dædalus had enlarged the top, and inclosed it with a strong wall. He also consecrated there to Venus Erycina a golden heifer, which resembled life so much, that it seemed to exceed the power of art.

ERZERUM, or **ERZERON**, a city of Turkey in Asia, and capital of Armenia, or Turcomania. It is a pretty large town, five days journey from the Black sea, and ten from the frontiers of Persia. It stands in a delightful plain, at the foot of a chain of mountains, which hinder the Frat, or Euphrates, from falling into the Black sea. A neighbouring hill supplies very fine springs, which not only water the fields, but the streets of the town. Erzerum is surrounded with double walls, defended by pentagonal towers; but the ditches are neither deep nor well kept up. The beglerbeg, or bashaw of the province, lives in the seraglio, which is very ill built. They reckon that there are 18,000 Turks at Erzerum, 6000 Armenians, and 10,000 Greeks. The Armenians have a bishop and two churches; and the Greeks have also a bishop, but the church is a miserable place. The last are mostly braziers, inhabiting the suburbs, who work the copper brought from the neighbouring mountain. They drive a great trade in copper utensils and furs, particularly martins skins. Five or six days journey from the town there are oaks that produce plenty of gall-nuts, which are brought hither. This place is the thoroughfare and resting place of all the merchants trading to the Indies, especially when the Arabs are watching for their prey round Aleppo and Bagdad. E. Long. 40. 50. N. Lat. 29. 46.

ESARHADDON, the son of Sennacherib, and his successor in the kingdom of Assyria. He is said to have reigned 29 years at Nineveh, from the year 3294 to 3323; besides which he reigned 13 years at Babylon, in all 42 years. He died in the year of the world 3336, and was succeeded by Saosduchinus. Esarhaddon, in the opinion of Sir Isaac Newton, seems to be the Sardanapalus who died, as Cleftarchus says, of old age, after the revolt of Syria; the name *Sardanapalus* being derived from *Afferhadon Pul*.

ESCALADE, or **SCALADE**, a furious attack of a wall or a rampart; carried on with ladders, to pass the ditch or mount the rampart; without proceeding in form, breaking ground, or carrying on regular works to secure the men.

When the troops are prepared to pass the ditch, either with the assistance of boards, hurdles, and fascines, when it is muddy, or with small boats of tin, or baskets covered with skins or oil-cloth, when it is deep and filled with water, a party must be placed on the counterescarp, opposite to the landing-place, ready to fire at the garrison if they are alarmed, and oppose the mounting on the rampart. If the ditch is dry, the ladders are fixed in some place farthest distant from the centre; and as soon as they get upon the rampart, they put themselves in order to receive the enemy; if the centre should be surprised and silently overcome, the detachment hastens to break open the gate, and to let in the rest of the party. If the ditch is wet, the rampart high, and provided with a revetement, it will

Erzerum
||
Escalade.

Escallonia be difficult to surprize the town in this way; but if there is no revetement, the troops may hide themselves along the outside of the rampart till all are over. Since the invention and use of gunpowder, and the walls of cities have been flanked, they are seldom taken by *escalade*.

ESCALLONIA, a genus of plants, belonging to the pentandria class. See *BOTANY Index*.

ESCAPE, in *Law*; a violent or privy evasion out of some lawful restraint, without being delivered by due course of law. There are two sorts of escapes, voluntary and negligent. Voluntary, when a man arrests another for felony, or other crime, and afterwards lets him go freely by consent; in which case, the party that permits such escape is held guilty, committed, and must answer for it. Negligent escape, on the contrary, is where one is arrested, and afterwards escapes against the will of the person that arrested him, and is not pursued with fresh suit, and retaken before the person pursuing hath lost sight of him. By stat. 8 and 9 Will. III. c. 26. the keepers of prisons conniving at escapes shall forfeit 500l.; and in civil cases the sheriff is answerable for the debt.

ESCHALOT, or *SHALLOT*. See *ALLIUM*.

ESCHAR, in *Surgery*, the crust or scab occasioned by burns or caustic medicines.

ESCHARA, in *Natural History*, the name of a species of coralline, &c. the characters of which are these: they are of a stony or coral-like hardness, and resemble a woven cloth in their texture; and the microscope informs us, that they consist of arrangements of very small cells, whose surfaces appear much in that form. Linnæus makes it a species of millepora, in the class of lithophytes.

ESCHEAT, in *Law*, signifies any land or tenements that casually fall to a lord within his manor. It is one of the consequences of tenure in chivalry: (See *FEODAL System*, *KNIGHT-SERVICE*, and *TENURE*). It is the determination of the tenure or dissolution of the mutual bond between the lord and tenant, from the extinction of the blood of the latter by either natural or civil means: if he died without heirs of his blood, or if his blood was corrupted and stained by commission of treason or felony; whereby every inheritable quality was entirely blotted out and abolished. In such cases the land escheated or fell back to the lord of the fee; that is, the tenure was determined by breach of the original condition, expressed or implied in the feodal donation. In the one case, there were no heirs subsisting of the blood of the first feudatory or purchaser, to which heirs alone the grant of the feud extended: to the other, the tenant, by perpetrating an atrocious crime, showed that he was no longer to be trusted as a vassal, having forgotten his duty as a subject; and therefore forfeited his feud, which he held under the implied condition that he should not be a traitor or a felon. The consequence of which in both cases was, that the gift being determined, resulted back to the lord who gave it.

The word *escheat* is sometimes used for the place or circuit within which the king or other lord is intitled to escheats; also for a writ to recover the same from the person in possession after the tenant's death.

ESCHEAT, in *Scots Law*, is that forfeiture which is

incurred upon a person's being denounced a rebel. See *ESCHEVIN* *LAW*, Part III. N° clxvi. 12.

ESCHEVIN, or *ESCHEVIN* (*Scabinus*), in the French and Dutch polity, a magistrate elected by the inhabitants of a city, to take care of their common concerns, the good order, conveniency, and decoration of the city, &c.

At Paris there were formerly a *prevôt* and four *eschévins*; in most other cities a mayor and *eschévins*. In Languedoc, Provence, and Dauphiné, they were called *consuls*; at Toulouse, *capitouls*; and *jurats* at Bourdeaux.

Anciently the *eschévins* were the assessors and counsellors of the comites or judges of cities; on which account they were called in some places *pairs*, *parés*; they even took cognizance of petty causes themselves.

Du-Cange observes, that the judges and their assessors, who were chosen by the inhabitants, were called *scabini* "eschévins," and their college *scabinagium* or "eschévinage."

In Holland, the *scabins* or *eschévins* judge of all civil affairs at first hand. They also take cognizance of criminal matters: and if the criminal confess himself guilty, they can see their sentence executed without appeal. They can even give torture. The number is not the same in all cities; at Amsterdam there are nine, at Rotterdam seven, &c.

ESCHRAKITES, or *ESRAKITES*, a sect of philosophers, among the Mahometans, who adhere to the doctrines and opinions of Plato. The word is derived from the Arabic *شراقا* *schraca*, which in the fourth conjugation *اشراقا* *aschraca*, signifies "to shine, glitter like the sun" so that *Eschrakite* seems to import "illuminated."

The *Eschrakites*, or Mahometan Platonists, place their highest good and happiness in the contemplation of the Divine Majesty; despising the gross imaginations of the Alcoran touching paradise. They are very careful in avoiding all vice; they preserve an equal and easy temper, love music, and divert themselves with composing little poems or spiritual songs. The shaeicks or priests, and the chief among the preachers of the imperial mosques, are *Eschrakites*.

ESCLAIRCISSEMENT, a French term adopted into our language, signifying the explaining or clearing up of some difficulty or obscurity.

ESCORT, a French term, sometimes used in English authors to denote a convoy or company of armed men, attending some person or thing, in a journey or voyage, to defend or secure it from insults. Some derive the word from the Latin *cohors*.

ESCOUADE, or *SQUAD*, is usually the third or fourth part of a company of foot: so divided for mounting guards, and for the more convenient relieving of one another. It is equivalent to brigade of a troop of horse. See *BRIGADE*.

ESCUAGE, in our old customs, a kind of knight-service, called *service of the shield*, by which the tenant was bound to follow his lord to the wars at his own charge. See the articles *CHIVALRY*, *FEODAL System*, and *KNIGHT-SERVICE*.

ESCULAPIUS. See *ÆSCULAPIUS*.

ESCULENT, an appellation given to such plants, or the roots of them, as may be eaten: such are beets, carrots, artichokes, leeks, onions, parsnips, potatoes, radishes, scorzonera, &c.

ESCURIAL,

Escallonia
||
Escheat

Eschevin
||
Esculent

Escorial.

ESCURIAL, a royal residence of Spain, situated about 15 miles north-west of Madrid. It is the largest and most superb structure in the whole kingdom, and perhaps one of the finest in Europe. The word is Arabic, meaning "a place full of rocks." It is built in a dry barren spot, surrounded with rugged mountains, inasmuch that every thing which grows there is owing to art. This place was chosen, it is said, for the sake of the stone wherewith the fabric was built, which is got from a mountain just by, and is very durable; and the design of erecting it was to commemorate a victory which Philip II. obtained over the French (but by the assistance of the English forces) at St Quintin, on St Laurence's day, in the year 1557. The Spanish description of this structure forms a sizeable quarto volume, and it is said that its founder expended upon it six millions of ducats. The apartments are decorated with an astonishing variety of paintings, sculpture, tapestry, ornaments of gold and silver, marble, jasper, gems, and other curious stones, surpassing all imagination. This building, besides its palace, contains a church, large and richly ornamented; a mausoleum; cloisters; a convent; a college; and a library, containing about 30,000 volumes; besides large apartments for all kinds of artists and mechanics, noble walks, with extensive parks and gardens, beautified with fountains and costly ornaments. The fathers that live in the convent are 200, and they have an annual revenue of 12,000*l*. It was begun by Philip in 1562, five years after the battle; and completed in 22 years. It consists of several courts and quadrangles, which altogether are disposed in the shape of a gridiron, the instrument of the martyrdom of St Laurence; the apartments where the king resides form the handle. The building is a long square of 640 by 580, and the height up to the roof is all round 60 feet, except on the garden side, where the ground is more taken away. At each angle is a square tower 200 feet high. The number of windows in the west front is 200; in the east front 366. The orders employed are Doric and Ionic. There are three doors in the principal front. Over the grand entrance are the arms of Spain, carved in stone; and a little higher in a niche, a statue of St Laurence in a deacon's habit, with a gilt gridiron in his right hand, and a book in his left. Directly over the door is a basso-relievo of two enormous gridirons in stone. This vast structure, however, with its narrow high towers, small windows, and steep sloping roof, exhibits a very uncouth style of architecture: at the same time that the domes, and the immense extent of its fronts, render it a wonderfully grand object from every point of view. The church, which is in the centre of all, is large, awful, and richly but not affectedly ornamented. The cupola is bold and light. The high altar is composed of rich marbles, agates, and jaspers of great rarity, the produce of this kingdom. Two magnificent *catafalques* fill up the side arcades of this sanctuary: on one the emperor Charles V. his wife, daughter, and two sisters, are represented in bronze, larger than life, kneeling; opposite are the effigies of Philip II. and of his three wives, of the same materials, and in the same devout attitude. Underneath is the burial-place of the royal family, called the *Pantheon*. Twenty five steps lead down to this vault, over the door of which is an inscription, denoting, that

1

Escorial

||

Esdras.

Hic locus, sacer mortalitatis exuviis Catholicorum Regum, &c.

was intended by Charles the emperor, resolved upon by Philip II. begun by Philip III. and completed by Philip IV. The mausoleum is circular, 36 feet diameter, incrufted with fine marbles in an elegant taste. The bodies of the kings and queens lie in tombs of marble, in niches, one above the other. The plan of these sepulchres is grand, and executed with a princely magnificence; but, as a modern traveller observes, in a style rather too gay, too light, and too delicately fitted up for the idea we are apt to form of a chapel destined for the reception of the dead. The collection of pictures dispersed about various parts of the church, sacristy, and convent, has been considered as equal, if not superior, to any gallery in Europe except that of Dresden. Formed out of the spoils of Italy, and the wasted cabinet of that unfortunate diletante Charles I. of England, it contains some of the most capital works of the greatest painters that have flourished since the revival of the art. In the sacristy is an altar called *La santa Forma*: this is a kind of tabernacle or *custodia* of gems, marbles, woods, and other precious materials, inlaid in gilt bronze; in which, rather than in the excellence of the workmanship or taste of the design, consists the merit of this rock of riches. Before it hangs a curtain, on which Coello has represented Charles II. and all his court in procession, coming to place this *Forma*. This is esteemed one of the most curious collections of portraits in the world; for all the persons are drawn with the greatest strength of colour and truth of impression, and are said to be perfect resemblances not only of the monarch and grandees, but even of the monks, servants, and guards. The statues, busts, and medallions of the Escorial, are not in any great number, or very remarkable for their excellence: but the library contains a most precious collection of manuscripts, many fine drawings, and other curiosities. Notwithstanding the coldness of the exposure, the late king, for the sake of hunting, used to pass here several months of the year; and to make the place less inconvenient to his attendants and the nobility, he built an entire new town adjoining to it.

ESCUTCHEON, or SCUTCHEON, in *Heraldry*, is derived from the French *escuffon*, and that from the Latin *scutum*, and signifies the shield whereon coats of arms are represented.

Most nations of the remotest antiquity were wont to have their shields distinguished by certain marks painted on them; and to have such on their shields was a token of honour, none being permitted to have them till they had performed some honourable action.

* The escutcheon, as used at present, is square, only rounded off at the bottom.

ESDRAS, a Jewish priest, and doctor of the law. Artaxerxes Longimanus sent him with rich presents for the use and ornament of the temple at Jerusalem, rebuilt under Zerubbabel; the king also ordered the neighbouring governors to provide him with what conduced to the pomp of the Jewish religion, and to exempt the priests from paying taxes. He is supposed to be the collector of the Canon of Scripture; and that, by divine inspiration, he added some things which happened

Es
||
Esne.

pened after the deaths of the authors. It is guessed he wrote the Chronicles, besides those books which bear his name, the two last of which are exploded even by the church of Rome.

ESK, the name of several rivers both in England and Scotland, particularly of one which forms part of the boundary between the two kingdoms. It runs from north-east to south-west, and gives name to the district of Eskdale.

ESKI-HISSAR. See STRATONICEA.

E KIMAUX. See ESQUIMAUX.

ESNE, or ESNEH, a considerable sea-port town of Upper Egypt. It is governed by an Arabian prince, and by a cachef, dependant on the bey of Girze. The Mahometans have several mosques here, and the Coptis a church served by two priests. "Esne (says Abulfeda), remarkable for its public baths and its commerce, is built on the westward of the Nile, between Assouan and Cous, but nearer to this latter. It acknowledges, adds the geographer of Nubia, the Coptis for founders. Its well cultivated territory abounds in grain and palm-trees. It is surrounded by gardens filled with fruit-trees. One admires here several ancient monuments constructed by the Coptis, and superb ruins." This description answers to Esne in our time, which is situated on the edge of a rich country, and shaded by groves of orange trees loaded with fruits and flowers. This town, formerly called *Latopolis*, revered Minerva and the fish *Latus* (Strabo). It contains within its boundary an antique temple; thick walls inclose it on three sides. Six large fluted columns, crowned by a capital ornamented with the palm leaf, form the façade of it; 18 others support the roof, which is composed of large squares of marble; the building is surrounded by a frieze, and innumerable hieroglyphics cover its exterior aspects.

A little to the south of the town are seen the ruins of a monastery founded by St Helena, and near it the burying-place of the martyrs, adorned with tombs crowned by cupolas, supported by arcades. The inhabitants of Esne having revolted against the persecution of Dioclesian, that emperor destroyed this town and put them to the sword. This place, consecrated by religion, is become a celebrated pilgrimage among the Coptis. They repair thither from the most distant provinces of the kingdom. In the chain of mountains which stretches to the eastward of the Nile, and nearly opposite Esne, are quarries of a soft stone, called *Baram*. It is made use of for kitchen utensils. It hardens in the fire, and forms excellent kettles and pans, which give no bad taste to the victuals. This stone is probably the *lapis ollaris*, or *pot-stone*.

"Esne (says Denon*) is the ancient Latopolis. Some remains are still visible of its port or quay on the bank of the Nile, which has been often repaired; but, notwithstanding all that has been done for it, still remains in a very miserable condition. This town also contains the portico of a temple, which appears to me to be the most perfect monument of ancient architecture. It is situated near the bazar in the great square, and would make an incomparable ornament to this spot, if the inhabitants had any idea of its merit; but instead of this they have deformed it by the most miserable ruined hovels, and have devoted it to the vilest purposes. The portico is very well preserved, and possesses a great

VOL. VIII. Part I.

richness of sculpture: it is composed of eighteen columns with broad capitals; these columns are noble and elegant, though they now appear in the most disadvantageous light: the rubbish should be cleared to find if any part of the *cella* remains.

"The hieroglyphics in relief, with which it is covered within and without, are executed with great care; they contain, among other subjects, a zodiac, and large figures of men with crocodiles heads: the capitals, though all different, have a very fine effect; and as an additional proof that the Egyptians borrowed nothing from other people, we may remark, that they have taken all the ornaments, of which these capitals are composed, from the productions of their own country, such as the lotus, the palm-tree, the vine, the rush, &c. &c."

ESOX, a genus of fishes belonging to the order of abdoninales. See ICHTHYOLOGY *Index*.

ESPALIERS, in *Gardening*, are rows of trees planted about a whole garden or plantation, or in hedges, in such a manner as to enclose quarters or separate parts of a garden; and are trained up regularly to a lattice of wood-work in a close hedge, for the defence of tender plants against the injuries of wind and weather. They are of admirable use and beauty in a kitchen-garden, serving not only to shelter the tender plants, but screen them from the sight of persons in the walks.

The trees chiefly planted for espaliers, are apples, pears, and some plums: some plant apples grafted upon paradise stocks; but as these are of short duration, it is better to plant those grafted upon crabstock, or upon what the gardeners call *Dutch stocks*; which will both cause them to bear sooner, and prevent their growing too luxuriant. The best kinds of apple for this purpose, are the golden pippen, nonpareil, renette, &c. and the best sorts of pear, are the jargonelle, blanquett, &c. These last, if designed for a strong moist soil, should be grafted upon quince stocks; but if for a dry soil, upon free stocks.

While the trees are young, it will be sufficient to drive a few stakes into the ground on each side of them; fastening the branches to these in a horizontal position, as they are produced. This method will do for the three first years; after which an espalier should be made of ash-poles, whereof there must be two sorts, larger and smaller; the former to be driven upright into the ground a foot asunder, and the latter, or slender poles, to be nailed across these, at about nine inches. Some prefer to this another sort of espalier, made of square timber cut to any size; these are, indeed, more tightly, but withal vastly more expensive.

When the espalier is thus framed, the branches are to be fastened to it with osier-twigs; observing to train them in a horizontal position, and at equal distances. Fruit trees thus managed are preferable to any others; not only as bearing better-tasted fruit, but as taking up very little room in a garden, so as to be less hurtful to plants which grow in the quarters.

ESPLANADE, in *Fortification*, the sloping of the parapet of the covered-way towards the champaign.

ESPLEES, in *Law*, the general products which lands yield, or the profit or commodity that is to be taken or made of a thing.

ESPOUSALS, in *Law*, signify a contract or promise

Es
||
Espousals.

* Trav. ii.
103.

Esquiliae
||
Esquire.

mise made between a man and a woman to marry each other; and in cases where marriages may be consummated espousals go before. Marriage is termed an espousal *de presenti*.

The espousals among the Jews were either by writing, or by a piece of silver given and received, or by cohabitation. Amongst the Greeks, after the parents and friends of the young couple had finished their negotiation, the couple themselves pledged their faith to each other, the man swearing that he would be constant and true, the woman that she would marry him, and make him master of all she had. Then they ratified their agreement by a kiss and joining right hands.

Amongst the Romans the espousals consisted in an engagement of friends on both sides, whether absent, or present, in public or without witnesses. But the common way was by writings drawn up by common consent, and sealed by both parties: besides this, the man sent a ring to the woman, consisting of iron and without a stone.

ESQUILIAE, in *Ancient Geography*, one of the seven hills of Rome, which Varro will have to be two, viz. Cispian and Oppian; also Mons Esquilinus, softened from Exquilinus; and this again from Excubinus, the watch or guard Romulus kept here, from a jealousy he entertained of his colleague Titus Tatius. On the east side it reached the city walls; on the south, the Via Lavicana; on the west, the wide valley between Mount Coelius and the Palatine; on the north, the Mons Viminalis; on the east side was the Porta Esquilina. This hill by some of the ancients was called *Suburranus*, from the street *Suburra* to the north of it: by the poets, *Esquilinus*.

ESQUIMAUX, a people of North America inhabiting all that vast tract of land known by the name of *Labrador*, or *New Britain*. They differ very considerably, both in aspect and manners, from the other American nations; agreeing in most respects with the inhabitants of West Greenland. See *NEW BRITAIN* and *GREENLAND*.

ESQUIRE (from the French *escu*, and the Latin *scutum*, in Greeks *σκατος*, which signifies a hide, of which shields were anciently made, and afterwards covered; for, in the time of the Anglo-Saxons, the shields had a covering of leather), was originally he who, attending a knight in time of war, did carry his shield; whence he was called *escuier* in French, and *scutifer*, or *armiger*, i. e. armour-bearer, in Latin. Hotoman says, that those whom the French call *esquires*, were a military kind of vassals, having *jus scuti*, viz. liberty to bear a shield, and in it the ensigns of their family, in token of their gentility or dignity. But this addition hath not of long time had any relation to the office or employment of the person to whom it hath been attributed, as to carrying of arms, &c. but hath been merely a title of dignity, and next in degree to a knight. For those to whom this title is now due, see the article *COMMONALTY*. Officers of the king's courts, and of the king's household, counsellors at law, justices of the peace, are only *esquires* in reputation; and he who is a justice of peace has this title only during the time he is in commission, and no longer, if he is not otherwise qualified to bear. A sheriff of a county being a superior officer, bears the title of *esquire* during his

life; in respect of the great trust he has in the commonwealth. The chiefs of some ancient families are esquires by prescription; and in late acts of parliament for poll money, many wealthy persons commonly reputed to be such, were ranked among the esquires of this kingdom.

There is a general opinion, that every gentleman of landed property who has 300l. a-year, is an esquire; which is a vulgar error: for no money whatsoever, or landed property, will give a man properly this title, unless he comes within one of the above rules: and no person can ascribe this title where it is not due, unless he pleases; there being no difficulty in drawing the line by the accounts given above and in the article *COMMONALTY*: but the meaner ranks of people, who know no better, do often basely prostitute this title; and, to the great confusion of all rank and precedence, every man who makes a decent appearance, far from thinking himself any way ridiculed by finding the superscription of his letters thus decorated, is fully gratified by such an address.

ESQUIRES of the king, are such as have that title by creation, wherein there is some formality used, as the putting about their necks a collar of SS. and bestowing on them a pair of silver spurs, &c.

ESRAKITES. See *ESCHRAKITES*.

ESSAY, a trial or experiment for proving the quality of any thing; or an attempt to learn, whether or not any invention will succeed.

ESSAY, in literature, a peculiar kind of composition, the character whereof is to be free, easy, and natural; not tied to strict order or method, nor worked up and finished like a formal system.

ESSAYING, or ASSAYING, in *Chemistry* and *Metallurgy*, signifies the examination of a small quantity of any ore or mineral by fire, in order to discover the quantity of metal it contains. This is very necessary for those who intend to deal largely in metallurgic operations, in order to avoid unnecessary expence, by becoming previously acquainted with the nature of the ore. See *CHEMISTRY* and *MINERALOGY Index*.

Essay-Hatch, is the miners term for a little trench or hole, which they dig to search for shoad or ore.

ESSEDARII, a sort of gladiators, mentioned by Seneca, Suetonius, and Tully, who on some occasions engaged one another out of chariots called *essedæ*. The *essedum* was a sort of heavy chariot from which the Gauls and Britons engaged the Romans. See *GLADIATOR*.

ESSENCE, in *Metaphysics*, that which constitutes the particular nature of each genus or kind, and distinguishes it from all others: being nothing but that abstract idea to which this name is affixed, so that every thing contained in it is essential to that particular kind.

This Mr Locke calls the *nominal essence*; in contradistinction to the real essence, or constitution of substances on which this nominal essence depends. Thus the nominal essence of gold is that complex idea the word *gold* stands for; let it be, for instance, a body, yellow, weighty, malleable, fusible, and fixed: but its real essence is the constitution of its insensible parts, on which these qualities and all its other properties depend, which is wholly unknown to us.

ESSENES, or ESSENIANS, in Jewish antiquity, one

Esquires
||
Essenes.

Essential,
Essex

one of the three ancient sects among that people. They allowed a future state, but denied a resurrection from the dead. Their way of life was very singular: they did not marry; but adopted the children of others, whom they bred up in the institutions of their sect: they despised riches, and had all things in common, and never changed their clothes till they were entirely worn out. When initiated, they were strictly bound not to communicate the mysteries of their sect to others; and if any of their members were found guilty of enormous crimes, they were expelled.

Pliny tells us, that they dwelt on the west side of the lake of Asphaltites; and that they were a solitary kind of men, living without women or money, and feeding upon the fruit of the palm-tree: he adds, that they were constantly recruited by new comers, whom the furies of ill fortune had made weary of the world: in which manner the sect was kept up for several thousands of years, without any being born among them. The reason why we find no mention made of them in the New Testament, may be their reclusé and retired way of life, not less than their great simplicity and honesty, whereby they lay open to no censure or reproof.

ESSENTIAL, something necessarily belonging to a thing, from which it cannot be conceived distinct: thus the primary qualities of bodies, as extension, figure, number, &c. are essential or inseparable from them in all their changes and alterations.

ESSENTIAL Oils are such as are really contained in a plant, and are drawn from it by distillation in an alembic with water: they are thus called, in contradistinction to empyreumatic oils, which are raised by a naked fire without water.

ESSEX, a county of England, bounded on the north by the Stour, which separates it from Suffolk and Cambridgeshire; on the east, by the German sea; on the west, by Hertfordshire and Middlesex; and on the south by the river Thames. It extends 46 miles in length from east to west and about 42 in breadth from north to south, and 200 in circuit. This county is in the diocese of London, and gives the title of earl to the family of Capel. The county of Essex is divided into nineteen hundreds, and contains twenty-seven market-towns, 415 parishes, 125 vicarages, and 1100 villages. It sends eight members to parliament; namely, two for the county, and two for Colchester, Harwich, and Malden. The air in the inland parts is healthy; but in the marshes near the sea it produces agues, particularly in the part called the Hundreds. However, the fertility of the unwholesome part is very great, and even the higher grounds of this county are very fruitful. About Saffron Walden, the earth, after bearing saffron three years, it is said, will produce good barley for 18 years successively without any manure. Its produce, which is very plentiful, consists of corn, most excellent saffron, cattle, fowl, fish, and particularly oysters. The chief manufactures of this county are cloth, stuffs, and particularly baize. The principal rivers, besides the Thames, are the Stour, which falls into the German sea at Harwich; the Lea, its western boundary, falls into the Thames below Stratford; the Blackwater runs through the heart of the county, and passing by Chelmsford is

joined by the Chelmer, and from thence runs into the German sea; the Coln runs by Halsted to Colchester, and so into the sea. The Roding which rises northwards, near Dunmow, runs into the Thames near Barking. All these rivers abound in most sorts of fish.

In the year 1801, the total number of inhabitants in the county of Essex amounted to 226,437 persons. Of these 111,356 are males, and 115,081 are females. They are divided into 46,784 families, occupying 38,371 houses. The number employed in agriculture is 65,174; and in trade, manufactures, &c. 25,283.

ESTATE, in *Law*, signifies the title or interest that a person has in lands, tenements, or other effects; comprehending the whole in which a person hath any property, and will pass the same.

Estates are either real or personal; otherwise distinguished into **FREEHOLDS**, which descend to heirs; or **CHATTELS**, that go to executors or administrators.

A fee-simple is the amplest estate our law admits of. See **FEE**.

Estates are obtained several ways; as, by descent from a father to a son; by conveyance or grant from one person to another; by gift or purchase; or by deed or will. See **DESCENT**, **SUCCESSION**, **TENURE**, &c.

ESTATES, in a political-sense, is used either to denote the dominions of some prince, or the general classes into which the people are divided.

In Britain, the estates are the king, lords, and commons; or rather the lords and commons, who meet the king in parliament, for reforming abuses, and enacting good and wholesome laws.

ESTHER, a canonical book of the Old Testament; containing the history of a Jewish virgin, dwelling with her uncle Mordecai at Shushan, in the reign of Ahasuerus, one of the kings of Persia.

The great beauty of this maid raised her to the throne of Persia; whereby she had an opportunity to save her countrymen, whose destruction was plotted by Haman, a favourite of that prince.

The learned are not agreed who this Ahasuerus was. Archbishop Usher supposes him to be Darius Hystaspes, and Artystona to be Esther. Scaliger makes him the same with Xerxes, and his queen Hanestris to be Esther. Josephus, on the contrary, positively asserts, that the Ahasuerus of the scriptures, is the Artaxerxes Longimanus of profane story; and the Septuagint, throughout the whole book of Esther, translate Ahasuerus by Artaxerxes. Most people subscribe to this last opinion; and indeed the extraordinary kindness showed by Artaxerxes to the Jews, can scarcely be accounted for otherwise than by supposing that they had so powerful an advocate as Esther to solicit for them.

ESTOILE'E, or **CROSS ESTOILLE'E**, in *Heraldry*, a star with only four long rays in form of a cross; and, accordingly, broad in the centre, and terminating in sharp points.

ESTONIA, is a province of the Russian empire, and part of Livonia. It is bounded on the east by the Baltic sea, on the north by the gulf of Finland, on the west by Ingria, and on the south by Lettonia. It is divided into six districts: 1. Harrien; 2. Wieland; 3. Alentakin; 4. Wich; 5. Jerven; and, 6. Odepoa.

Estate
||
Estonia.

Estoppel
||
Estremadura.

The principal towns are, Revel, Weifenberg, Borchholm, Narva, Nylot, Habfal, Derpt, St Elin, Pernau, and Roderfwick.

In former times the inhabitants of this country carried on a good trade in corn, which was dried in stoves: but wars have much depopulated the country, insomuch that not a fourth part of it is inhabited, and a great number of gentlemen's seats lie in ruins.

ESTOPPEL (formed of the French *eslouper, oppilare, obstopare*, "to stop, or block up"), in *Law*, an impediment or bar of action, arising from a man's own act or deed; against which a man is forbidden, by law, to speak, though it be to say the truth.

ESTOVERS, in *Law*, is used, by Bracton, for that sustenance which a man, committed for felony, is to have out of his lands or goods for himself and his family during imprisonment. In stat. 6 Edw. I. it is used for an allowance in meat or clothes. In some manors, the tenants have *common of estovers*; that is, necessary botes or allowances out of the lord's wood: in which last sense, estovers comprehends house-bote, hay-bote, and plow-bote; so that if a man have in his grant these general words, *de rationabili estoverio in boscis*, &c. he may thereby claim all three.

Estovers is also used for alimony, which, if the husband refuses to pay, there is, besides the ordinary processes of excommunication, a writ at common law, *de estoveriis habendis*, in order to recover it.

ESTRAY, or STRAY, signifies any tame beast, as sheep, oxen, swine, and horses, or swans, found within a lordship, and not owned by any man; in which case being cried, according to law, in the church, and two market towns adjoining, if it be not claimed by the owner within a year and a day, it becomes the lord's of the soil where found. If the owner claims it within the year and day, he must pay the charges of finding, keeping, and proclaiming them; and he may seize it, without telling the marks or proving his property, which may be done at the trial if contested. If the beast stray within the year to another lordship, the first lord cannot retake it. An estray must be fed and kept, uninjured, and without labour, till it is reclaimed or the limited time expires.

ESTREAT, EXTRACTUM, in *Law*, is used for the true copy or duplicate of some original writing, especially of ameracements or penalties set down in the rolls of a court, to be levied by the bailiff or other officer, on every offender.

ESTREMADURA, a province of Spain, has New Castile on the east, Leon on the north, Andalusia on the south, and Portugal on the west. It is 175 miles in length, and 100 in breadth; and its principal towns are, Calatrava, Menda, and Badajoz, on the river Guadiana; Alcantara, on the Tajo; and Cona and Placentia, to the north of this river.

This province enjoys a very pure and healthful air, and its mountains are full of wild and tame animals; they having woods and forests for the one sort, and pastures for the other. The fields are planted with fruit-trees, which bear all kinds of delicious fruit. The vineyards produce excellent wines of all colours, and the fields yield plenty of corn.

ESTREMADURA, a province of Portugal, near the mouth of the Tagus or Tajo, bounded on the north by Beira, on the east and south by Alentejo, and on

the west by the Atlantic ocean. It is about 88 miles in length, and 45 in breadth. This province is divided into six comarcas, viz. Litria, Lisbon, Tomar, Santaren, and Alanquar, to the north of the Tagus; and that of Setubal, to the south of this river. These are likewise the principal towns. Estremadura is equal, if not preferable, to any other province in Spain or Portugal. The district of Santaren produces such plenty of corn, and feeds so many flocks of sheep, that it may enter into competition with Sicily. The fruits and the wines are all excellent; and it was here that the sweet oranges brought from China were first planted, and of which there are large quantities transported to foreign parts, with the wines and other fruits. The fields are covered with flowers almost all the year, from which the bees collect large quantities of fine honey. The olive-trees are numerous, from which they have excellent oil. The rivers abound with good fish, and the mountains have quarries of several kinds.

ETCHING, a method of engraving on copper, in which the lines or strokes, instead of being cut with a tool or graver, are eaten in with aquafortis. See ENGRAVING.

Etching is of a later invention, though not very modern, than engraving with the tool; of which it was at first only an imitation, that was practised by painters and other artists, who could much sooner form their hands to, and attain a faculty of, working in this way, than with the graver. But being then nevertheless considered as a counterfeit kind of engraving, and therefore inferior to the other, it was cultivated in a very confined manner; the closeness of the resemblance of the work to that performed by the tool, being made the test of its merit, and consequently the principal object of aim in those who pursued it. This servile confinement of the art of etching to the imitation of the original kind of engraving, was a great cause of retarding its advancement towards perfection, as many of the most able masters cramped their talents with the observance of it: which may be seen in the instances of Sadelers, Swaneberg, Villamena, and particularly Le Bosse; who, in his treatise on engraving, has laid down as a principle, that the perfection of this kind consists in the close similitude of the work with that done by the tool. This absurd prepossession has been since worn out: and the method of working with aquafortis has been so far improved, that instead of being now deemed a spurious kind of engraving, it evidently appears the foundation of an excellence in many modern works, that could never have been produced without it: since, though the neatness and uniformity of the hatches, which attend the use of the tool, is more advantageous with respect to portraits; yet the liberty and facility of the other manner give a much greater opportunity to exercise the force of genius and fancy in history-engraving; where the effect of the whole, and not the minute exactness in finishing all the parts, constitutes the principal value.

There are two methods practised of engraving in this way; the one with a hard varnish or ground, the other with a soft. The first was formerly much used, being better accommodated to the intention of imitating the engraving with the tool; as the firmness of the body of the varnish gave more opportunity of retouching the

Etching.

lines,

Etching. lines, or enlarging them with the oval-pointed needles, called by the French *échoppes* as was practised by Le Boile and others for that purpose. The latter has now almost wholly superseded the use of the other, by the free manner of working it admits of; which affords a power of expression incompatible with the greater inflexibility of the hard varnish, that confines the lines and hatches to such a regularity and sameness, as gives a stiffness of manner and coldness of effect to the work.

The mixture of the use of the tool and aquafortis, which are now both employed in many cases, has, however, given that perfection to engraving which it possesses at present. The truth and spirit of the outline that the method of working with aquafortis affords, and the variety of shades which the different kinds of black produce in this way, as well as other means of expressing the peculiar appearance and character of particular subjects, furnish what was defective in the sole use of the tool; while, on the other hand, the exactness and regularity of the lines, which are required for finishing many kinds of designs, are supplied by the graver; and by a judicious application of both, that complete finishing is obtained, which either of them alone must necessarily want.

The manner by which this art is performed, is the covering the surface of the plate with a proper varnish or ground, as it is called, which is capable of resisting aquafortis; and then scoring or scratching away, by instruments resembling needles, the parts of this varnish or ground, in the places where the strokes or hatches of the engraving are intended to be; then, the plate being covered with aquafortis, the parts that are laid naked and exposed by removing the ground or varnish, are corroded or eaten away by it; while the rest, being secured and defended, remain untouched.

There are two methods of etching, as has been already observed; the difference of which from each other consists, as well in the difference of the varnish or ground, as in that of the aquafortis, adapted to each kind; but the general methods of performing them are alike in both. These varnishes or grounds are distinguished by the names of *hard* and *soft*: for in their consistence, or the resistance they give to the needles, lies their essential variation from each other. The hard varnish, it is with good reason conjectured, was not the first in use: but soon took place of the other; and was, for some time, the most received in practice, on account of its admitting the work to be made more like that of the graver: the soft has, however, since, in its turn, prevailed to the exclusion of it in some degree, except in the case of particular subjects; but not so entirely as to take away the expedience of showing how it is performed. The manner of etching with the soft varnish is now, however, one of the most important objects of the art of engraving; and it is at present in universal use, sometimes alone, but more frequently intermixed with the work of the tool, and in some cases with great advantage, even where the whole is intended to pass for being performed by the graver.

Preparation of the soft varnish; according to Mr Lawrence, an eminent English engraver at Paris. "Take of virgin wax and asphaltum, each two ounces; of

black pitch and Burgundy pitch, each half an ounce. Melt the wax and pitch in a new earthen-ware glazed pot; and add to them by degrees, the asphaltum finely powdered. Let the whole boil till such time as that, taking a drop upon a plate, it will break when it is cold, on bending it double two or three times betwixt the fingers. The varnish being then enough boiled, must be taken off the fire; and letting it cool a little, must be poured into warm water, that it may work the more easily with the hands, so as to be formed into balls; which must be rolled up, and put into a piece of taffety for use."

It must be observed, first, that the fire be not too violent, for fear of burning the ingredients; a slight simmering will be sufficient: secondly, that while the asphaltum is putting in, and even after it is mixed with them, the ingredients should be stirred continually with the spatula; and thirdly, that the water, into which this composition is thrown, should be nearly of the same degree of warmth with it, to prevent a kind of cracking that happens when the water is too cold.

The varnish ought always to be harder in summer than in winter; and it will become so if it be suffered to boil longer, or if a greater proportion of the asphaltum or brown resin be used. The experiment above-mentioned, of the drop suffered to cool, will determine the degree of hardness or softness that may be suitable to the season when it is used.

Preparation of the hard varnish used by Callot, commonly called the Florence varnish. Take four ounces of fat oil very clear, and made of good linseed oil, like that used by painters: heat it in a clean pot of glazed earthen-ware, and afterwards put to it four ounces of mastic well powdered; and stir the mixture briskly till the whole be well melted; then pass the whole mass through a piece of fine linen into a glass bottle with a long neck, that can be stopped very securely; and keep it for the use that will be below explained.

Method of applying the soft varnish to the plate, and of blackening it. The plate being well polished and burnished, as also cleansed from all greasiness by chalk or Spanish white, fix a hand-vice on the edge of the plate where no work is intended to be, to serve as a handle for managing it when warm: then put it upon a chafing-dish, in which there is a moderate fire; observing to hold it so that it may melt: then cover the whole plate equally with a thin coat of the varnish; and while the plate is warm, and the varnish upon it in a fluid state, beat every part of the varnish gently with a small ball or dauber made of cotton tied up in taffety; which operation smoothes and distributes the varnish equally over the plate.

When the plate is thus uniformly and thinly covered with the varnish, it must be blackened by a piece of flambeau, or of a large candle which affords a copious smoke; sometimes two, or even four, such candles are used together for the sake of dispatch, that the varnish may not grow cold: which if it does during the operation, the plate must then be heated again, that it may be in a melted state when that operation is performed: but great care must be taken not to burn it; which, when it happens, may be easily perceived by the varnish appearing burnt and losing its gloss. The following expedient is made use of for the more commodiously blackening

Etching.

Etching

blackening the varnish, being particularly necessary where the plates are large: Fix a strong hook in the roof of the room, through which pass four pieces of cord of equal length, at the end of which are fixed four iron rings of about four inches diameter, for supporting the corners of the plate. The plate being thus suspended in the air, with the varnished side downwards, may be blackened with great convenience: but this is not, however, absolutely requisite, except in the case of large plates that could not, without difficulty, be held up, unless this or some other such contrivance were made use of.

It is proper to be very cautious in keeping the flambeau or candle at a due distance from the plate, lest the wick touch the varnish, which would both fully and mark it. If it appear that the smoke has not penetrated the varnish, the plate must be again placed for some little time over the chafing-dish; and it will be found, that, in proportion as the plate grows hot, the varnish will melt and incorporate with the black which lay above it, in such a manner that the whole will be equally pervaded by it.

Above all things, the greatest caution should be used in this operation, to keep all the time a moderate fire; and to move frequently the plate, and change the place of all the parts of it, that the varnish may be alike melted everywhere, and kept from burning. Care must also be taken, that during this time, and even till the varnish be entirely cold, no filth, sparks, or dust, fly on it; for they would then stick fast, and spoil the work.

Method of applying the hard varnish. This is precisely the same as for the soft; being spread equally over the warm plate with the taffety-ball, and smoked in the same manner: only after it is smoked, it must be baked, or dried over a gentle fire of charcoal, till the smoke from the varnish begins to decrease; taking care not to overheat the plate, which would both soften it and burn the varnish.

The plate being thus prepared, and an exact drawing of the outlines of the design made upon thin paper, the other side of the paper must be well rubbed with chalk or Spanish whitening, or, which is better, with red chalk scraped to a powder; and the loose chalk is cleared off with a linen rag: then the stained side of the paper is laid upon the varnish, fixing the corners to the plate with wax or wafers, to prevent its shuffling; and with a blunted needle or pointer the drawing is slightly traced, and communicates to the varnish an exact outline of the design to be etched.

A variety of pointers is necessary for the work. Those used for the broad large strokes ought to be very blunt, exceeding round, and well polished at the point; the sole of a shoe answers very well for polishing the points. The finest ought to be as sharp as a needle. If any scratches or false strokes happen in the working, they are to be stopped up with a hair-pencil dipped in Venetian varnish, mixed with lamp-black, by which means these places will be defended from the action of the aquafortis.

The next operation is that of eating or corroding the plate with aquafortis; in order to which, a border of soft wax (being a composition of bees wax melted and tempered with a little Venice turpentine and tal-

low) must be fastened round the plate about an inch high, in the form of a little wall or rampart, to contain the aquafortis. At one of the corners of this border a gutter is usually made, which serves for pouring commodiously the aquafortis off the plate. The plate being thus bordered, take a due quantity of the refiners aquafortis; mix it with half its quantity of common water; and pour it gently on, till it rise above a finger's breadth above the surface of the plate; when, if all things have been rightly conducted, it will be seen that the aquafortis will soon exert its action in the hatches which have been strongly touched; but those more weakly engraved will appear at first clear, and of the colour of the copper. The menstruum must therefore be suffered to continue on the plate till its effects become visible on the more tender parts: then the aquafortis should be poured off, the plate washed with clean water, and dried before the fire: then take a small pencil dipped into the Venetian varnish, and cover with it the lighter parts of the plate. This being done, the aquafortis must again be poured on, and suffered to continue a longer or shorter time, according to the strength of the menstruum, or the nature of the engraving; when it must be again poured off as before and the plate immediately washed with water.

It may not be improper to observe, that, when the aquafortis is on the plate, a feather should be used to cleanse away the foulness of the verdegris that gathers in the hatches when the aquafortis operates on them, and to give it more room to exert its action; for by moving the aquafortis to and fro on the plate by the feather, and brushing away the black saline matter where it appears to be formed, the hatches will be cleansed, and the aquafortis exert its whole force equally on every part.

The plate being thus sufficiently corroded by the aquafortis, and well washed with water, it must be warmed at the fire, and the border of wax removed; after which, it must be made hotter till the varnish melt; then it must be well wiped with a linen cloth, and afterwards rubbed heartily with oil of olives; when it will be ready to be retouched and finished by the graver. See the article ENGRAVING.

ETEOCLES, in fabulous history, a son of Œdipus and Jocasta. After his father's death, it was agreed between him and his brother Polynices, that they should both share the royalty, and reign alternately each a year. Eteocles by right of seniority first ascended the throne; but after the first year of his reign was expired he refused to give up the crown to his brother, according to their mutual agreement. Polynices, resolved to punish such an open violation of a solemn engagement, went to implore the assistance of Adrastus king of Argos. He received that king's daughter in marriage, and was soon after assisted with a strong army headed by seven famous generals. These hostile preparations were seen by Eteocles, who on his part did not remain inactive. He chose seven brave chiefs to oppose the seven leaders of the Argives, and stationed them at the seven gates of the city. He placed himself against his brother Polynices, and he opposed Menalippus to Tydeus, Polyphontes to Capaneus, Megareus to Eteocles, Hyperbius to Parthenopæus, and Lathenes to Amphiarus. Much blood was shed in light and unavailing skirmishes, and it was at last agreed between the two

Etching
||
Eteocles.

Ethiopia
||
Etmuller.

of moral philosophy. The word is formed from *ἠθός*, *ἠθῆ*, *mores*, "manners;" by reason the scope or object thereof is to form the manners. See *MORAL Philosophy*.

ETHIOPIA, an extensive region of Africa. See *ABYSSINIA*.

ETHIOPS, ANTIMONIAL, MARTIAL, and MINERAL. See *CHEMISTRY Index*.

ETHMOIDES, in *Anatomy*, a bone situated in the middle of the basis of the forehead or *os frontis*, and at the top of the root of the nose, filling almost the whole cavity of the nostrils. It has its name from *ἔθμος*, *cribrum*, "sieve", and *σῖδος*, "form," because all spongy and porous. See *ANATOMY Index*.

ETHNARCHA, ETHNARCH, (formed of *ἔθνος*, "nation," and *ἀρχή*, "command,") a governor or ruler of a nation.

There are some medals of Herod I. surnamed the Great, on one side whereof is found *Ἡρῶδου*, and on the other *Εθναρχου*, q. d. *Herod the Ethnarch*. After the battle of Philippi, we read that Antony, passing over into Syria, constituted Herod and Phasael his brother tetrarchs, and in that quality committed to them the administration of the affairs of Judea, (Jof. Ant. lib. xiv. cap. 23.) Herod therefore had the government of the province before ever the Parthians entered Syria, or before Antigonus's invasion, which did not happen till six or seven years after Herod was commander in Galilee, (Jof. lib. xiv. cap. 24, 25.) Consequently, Herod was then truly ethnarch, for he can be no otherwise denominated; so that it must have been in that space of time that the medals were struck, which only give him this title: which medals are a confirmation of what we read in history of the government which that prince was intrusted with before he was raised to the royalty.

Josephus gives Herod the appellation of *tetrarch* in lieu of that of *ethnarch*; but the two terms come so near to each other, that it is easy to confound them together.

Though Herod the Great left by will to Archelaus all Judea, Samaria, and Idumea, yet Josephus tells us he was then only called *ethnarch*.

ETHNOPHRONES, in antiquity, a sect of heretics in the seventh century, who made a profession of Christianity, but joined thereto all the ceremonies and follies of Paganism, as judicial astrology, sortileges, auguries, and other divinations.

ETIQUETTE, a French term, primarily denoting a ticket or title affixed to a bag or bundle of papers, expressing its contents. It is also used, when applied to the Spanish and some other courts, to signify a particular account of what is to be done daily in the king's household, and in the chief ceremonies relating to it. It likewise denotes those forms that regulate the decorum of conduct towards persons of various ranks and stations.

ETMULLER, MICHAEL, a most eminent physician, born at Leipzig in 1646. After having travelled through the greatest part of Europe, he became professor of botany, chemistry, and anatomy, at Leipzig, where he died in 1683. He was a very voluminous writer, his works making no less than 5 vols folio, as printed at Naples in 1728. His son Michael Ernest Etmuller was also an ingenious physician, who published several pieces, and died in 1732.

Etna
||
Etolia.

ÆTNA, or ÆTNA, a famous burning mountain of Sicily, and the largest in Europe. See *ÆTNA*.

ETOLIA, a country of ancient Greece, comprehending all that tract now called the *Despotat*, or *Little Greece*. It was parted on the east by the river Evenus, now the *Fidari*, from the *Loereses Ozolæ*; on the west, from *Acarnania* by the *Achelous*; on the north, it bordered on the country of the *Dorians* and part of *Epirus*; and, on the south, extended to the bay of *Corinth*.

The *Etolians* were a restless and turbulent people; seldom at peace among themselves, and ever at war with their neighbours; utter strangers to all sense of friendship or principles of honour; ready to betray their friends upon the least prospect of reaping any advantage from their treachery: in short, they were looked upon by the other states of Greece no otherwise than as outlaws and public robbers. On the other hand, they were bold and enterprising in war; inured to labour and hardships; undaunted in the greatest dangers; jealous defenders of their liberties, for which they were, on all occasions, willing to venture their lives, and sacrifice all that was most dear to them. They distinguished themselves above all the other nations of Greece, in opposing the ambitious designs of the *Macedonian* princes; who, after having reduced most of the other states, were forced to grant them a peace upon very honourable terms. The constitution of the *Etolian* republic was copied from that of the *Achæans*, and with a view to form, as it were, a counter alliance; for the *Etolians* bore an irreconcilable hatred to the *Achæans*, and had conceived no small jealousy at the growing power of that state. The *Cleomeneic* war, and that of the allies, called the *social war*, were kindled by the *Etolians* in the heart of *Peloponnesus*, with no other view but to humble their antagonists the *Achæans*. In the latter, they held out, with the assistance only of the *Eleans* and *Lacedæmonians*, for the space of three years, against the united forces of *Achaia* and *Macedon*; but were obliged at last to purchase a peace, by yielding up to Philip all *Acarnania*. As they parted with this province much against their will, they watched all opportunities of wresting it again out of the *Macedonian's* hands; for which reason they entered into an alliance with *Rome* against him, and proved of great service to the *Romans* in their war with him: but growing insolent upon account of their services, they made war upon the *Romans* themselves. By that warlike nation they were overcome, and granted a peace on the following severe terms: 1. The majesty of the *Roman* people shall be revered in all *Etolia*. 2. *Etolia* shall not suffer the armies of such as are at war with *Rome* to pass through her territories, and the enemies of *Rome* shall be likewise the enemies of *Etolia*. 3. She shall, in the space of 100 days, put into the hands of the magistrates of *Corcyra* all the prisoners and deserters she has, whether of the *Romans* or their allies, except such as have been taken twice, or during her alliance with *Rome*. 4. The *Etolians* shall pay down in ready money, to the *Roman* general in *Etolia*, 200 *Euboic* talents, of the same value as the *Athenian* talents, and engage to pay 50 talents more within the six years following. 5. They shall put into the hands of the con-

Etolia.

ful 40 such hostages as he shall choose; none of whom shall be under 12, or above 40 years of age: the prætor, the general of the horse, and such as have been already hostages at Rome, are excepted out of this number. 6. Etolia shall renounce all pretensions to the cities and territories which the Romans have conquered, though those cities and territories had formerly belonged to the Etolians. 7. The city of Oenis, and its district, shall be subject to the Acarnanians.

After the conquest of Macedon by Paulus Æmilius, they were reduced to a much worse condition; for not only those among them, who had openly declared for Perseus, but such as were only suspected to have favoured him in their hearts, were sent to Rome, in order to clear themselves before the senate. There they were detained, and never afterwards suffered to return into their native country. Five hundred and fifty of the chief men of the nation were barbarously assassinated by the partisans of Rome, for no other crime but that of being suspected to wish well to Perseus. The Etolians appeared before Paulus Æmilius in mourning habits, and made loud complaints of such inhuman treatment; but could obtain no redress: nay, ten commissioners, who had been sent by the senate to settle the affairs of Greece, enacted a decree, declaring, that those who were killed had suffered justly, since it appeared to them that they had favoured the Macedonian party. From this time those only were raised to the chief honours and employments in the Etolian republic who were known to prefer the interest of Rome to that of their country; and as these alone were countenanced at Rome, all the magistrates of Etolia were the creatures and mere tools of the Roman senate. In this state of servile subjection they continued till the destruction of Corinth, and the dissolution of the Achaean league; when Etolia, with the other free states of Greece, was reduced to a Roman province, commonly called the *province of Achaia*. Nevertheless, each state and city was governed by its own laws, under the superintendency of the prætor whom Rome sent annually into Achaia. The whole nation paid a certain tribute, and the rich were forbidden to possess lands anywhere but in their own country.

In this state, with little alteration, Etolia continued under the emperors, till the reign of Constantine the Great, who, in his new partition of the provinces of the empire, divided the western parts of Greece from the rest, calling them *New Epirus*, and subjecting the whole country to the *præfectus prætorii* for Illyricum. Under the successors of Constantine, Greece was parcelled out into several principalities, especially after the taking of Constantinople by the Western princes. At that time, Theodorus Angelus, a noble Grecian, of the imperial family, seized on Etolia and Epirus. The former he left to Michael his son; who maintained it against Michael Paleologus, the first emperor of the Greeks, after the expulsion of the Latins. Charles, the last prince of this family, dying in 1430 without lawful issue, bequeathed Etolia to his brother's son, named also *Charles*; and Acarnania to his natural sons, Memnon, Turnus, and Hercules. But, great disputes arising about this division, Amurath II. after the reduction of Thessalonica, laid hold of so favourable an opportunity, and drove them all out in 1432. The Ma-

Vol. VIII. Part I.

hometans were afterwards dispossessed of this country by the famous prince of Epirus, George Castriot, commonly called *Scanderbeg*; who, with a small army, opposed the whole power of the Ottoman empire, and defeated those barbarians in 22 pitched battles. That hero, at his death, left great part of Etolia to the Venetians; but, they not being able to make head against such a mighty power, the whole country was soon reduced by Mahomet II. whose successors hold it to this day.

ETON, a town of Bucks, situated on the river Thames, across which there is a bridge leading to Windsor. Eton has been long celebrated for its school and college, which were founded by Henry VI.; and King's college in the university of Cambridge admits none into the number of its fellows, who have not been brought up at Eton. It lies west from London, at the distance of about 20 miles.

The scholars of Eton school have a festival which has been celebrated from time immemorial, called the *Montem*, the observance of which was at first biennial, but is now triennial, on the *Whit Tuesday in every third year*. It commences by a number of the older boys taking post on the bridges, and guarding every other avenue around Windsor and Eton, as soon as the day begins to dawn.

They are generally selected on account of their fine figures and superior activity. Their dresses are all fanciful, composed of silks, satins, &c. some of them very richly embroidered, and chiefly in the appearance of running footmen, having poles in their hands, and denominated *salt-bearers*, who demand salt of every passenger they meet, by which they mean a contribution, and peremptorily insist on receiving it. The contribution being given, which consists of whatever the person pleases to bestow, a printed paper is delivered, containing their motto, together with the date of the year; and this being produced to any other salt-bearer, exempts the passenger from the payment of any farther contributions during that day. The motto is,

“ *Pro more et monte.
Vivant rex et regina.* ”

They continue levying contributions in this manner from the dawn of day till about three o'clock in the afternoon, at which time the procession closes. It commences at noon, and consists of the queen's and other bands of music;—several standards carried by different students;—all the boys of Eton, two and two, dressed in the uniform of officers; those belonging to the king's foundation, wear blue, the rest scarlet uniform, swords, &c.—the grand standard bearer;—the captain, or head boy of Eton school;—the lieutenant, or second boy;—his majesty, attended by the prince of Wales, and other male branches of the royal family on horseback, with their suite;—the queen and princesses in coaches, attended by their suite;—band of music, followed by a great concourse of the nobility and gentry in their carriages, and on horseback.

The procession begins in the great square at Eton, proceeding through Eton to Slough, and round to Salt-hill, where the whole of the boys pass in review before the king and queen, and ascend the *montem*; where an oration is delivered, and the grand standard is displayed with much activity and grace by the standard-bear-

U u

er,

Etruria,
Etymology.

er, who is commonly selected from among the elder boys. Two extraordinary salt-bearers are chosen to wait upon their majesties, dressed in fanciful habits, and decorated in the most superb manner, carrying an embroidered bag, not only for the purpose of receiving what is denominated the *royal salt*, but also what may be collected by the other salt-bearers in different quarters. The donation of the king is 50 guineas, the queen's is the same sum; that of the prince of Wales is 30, and that of the other princes and princesses is 20 guineas each. This ceremony being over, the royal family return to Windsor. A sumptuous entertainment is provided for the boys at the tavern at Salt-hill, and the beautiful gardens are laid out for ladies and gentlemen to take refreshments, where bands of music are constantly performing.

At six o'clock in the evening, the boys return in the same order of procession as in the morning (but without the royal family), and after marching round the great square, are dismissed. After this the captain pays his respects to the royal family at the queen's lodge, Windsor, prior to his departure for King's college, Cambridge; to defray the expences of which, he is presented with the produce of the montem, which in the year 1796 amounted to more than 1000 guineas.

This joyful day is terminated by a brilliant exhibition of beauty, rank, and fashion; a promenade on the terrace of Windsor; bands of music performing, &c.: and the scene is rendered still more interesting and delightful by the humble, affable deportment of the royal family, who readily mingle with the company, and walk on the terrace till it is almost dark.

ETRURIA. See HETRURIA.

ETYMOLOGY, that part of grammar which considers and explains the origin and derivation of words, in order to arrive at their first and primary signification, whence Quintilian calls it *originatio*.—The word is formed of the Greek, *ετυμος*, *verus*, "true," and *λεγω*, *dico*, "I speak;" whence *λογια*, *discourse*, &c. and thence Cicero calls the etymology *notatio* and *veriloquium*; though Quintilian chooses rather to call it *originatio*.

A judicious inquiry into etymologies is thought by some of considerable use; because nations, who value themselves upon their antiquity, have always looked on the antiquity of their language as one of the best titles they could plead; and the etymologist, by seeking the true and original reason of the notions and ideas fixed to each word and expression, may often furnish an argument of antiquity, from the traces remaining thereof, compared with the ancient uses. Add, that etymologies are necessary for the thorough understanding of a language. For, to explain a term precisely, there seems a necessity for recurring to its first imposition, in order to speak justly and satisfactorily thereof. The force and extent of a word is generally better conceived when a person knows its origin and etymology.

It is objected, however, that the art is arbitrary, and built altogether on conjectures and appearances; and the etymologists are charged with deriving their words from where they please. And indeed it is no easy matter to go back into the ancient British and Gaulish ages, and to follow, as it were, by the track, the various imperceptible alterations a language has under-

gone from age to age; and as those alterations have sometimes been merely owing to caprice, it is easy to take a mere imagination or conjecture for a regular analogy: so that it is no wonder the public should be prejudiced against a science which seems to stand on so precarious a footing. It must certainly be owned, that etymologies are frequently so far fetched, that one can scarcely see any resemblance or correspondence therein. Quintilian has shown, that the ancient etymologists, notwithstanding all their learning, fell into very ridiculous derivations.

The etymologies of our English words have been derived from the Saxon, Welch, Walloon, Danish, Latin, Greek, &c.

In the present work the etymologies of terms are generally noted, where their obviousness does not render it unnecessary, or their dubiety or unimportance useless.

EVACUANTS, in *Pharmacy*, are properly such medicines as diminish the animal fluids, by throwing out some morbid or redundant humour; or such as thin, attenuate, and promote the motion and circulation thereof.

EVACUATION, in *Medicine*, the art of diminishing, emptying, or attenuating, the humours of the body.

EVAGRIUS SCHOLASTICUS, a famous historian, born at Epiphania, about the year 536. He practised the profession of an advocate, from which he was called *Scholasticus*, which name was then given to the pleaders at the bar. He was also tribune and keeper of the prefect's dispatches. He wrote an ecclesiastical history, which begins where Socrates and Theodoret ended theirs; and other works, for which he was rewarded by the emperors Tiberius and Mauricius. M. de Valois published at Paris a good edition of Evagrius's ecclesiastical history, in folio; and it was republished at Cambridge in 1620, in folio, by William Reading, with additional notes of various authors.

EVANDER, a famous Arcadian chief, called the son of Mercury, on account of his eloquence, brought a colony of his people into Italy, about 60 years before the taking of Troy; when Faunus, who then reigned over the Aborigenes, gave him a large extent of country, in which he settled with his friends. He is said to have taught the Latins the use of letters, and the art of husbandry. He kindly received Hercules when he returned from the conquest of Geryon, and he was the first who raised him altars. He gave Æneas assistance against the Rutuli, and distinguished himself by his hospitality. It is said that he first brought the Greek alphabet into Italy, and introduced there the worship of the Greek deities. He was honoured as a god after death, and his subjects raised him an altar on Mount Aventine.

EVANGELISTS, the inspired authors of the gospels. The word is derived from the Greek *ευαγγελιστος*, formed of *ευ*, *bene*, "well," and *αγγελος*, "angel or messenger."

The denomination *evangelists* was likewise given in the ancient church to such as preached the gospel up and down, without being attached to any particular church, being either commissioned by the apostles to instruct the nations, or of their own accord abandoning every worldly attachment, and consecrating themselves

Evacuants
||
Evangelists.

Evanid
||
Eucharist.

to the sacred office of preaching the gospel. In which sense some interpreters think it is that St Philip, who was one of the seven deacons, is called the *evangelist*, in the 21st chapter of the Acts of the Apostles, ver. 8. Again, St Paul writing to Timothy, ep. ii. cap. iv. ver. 5. bids him do the work of an evangelist. The same apostle, Eph. iv. 11. ranks the evangelists after the apostles and prophets.

EVANID, a name given by some authors to such colours as are of no long duration, as those in the rainbow, in clouds before and after sunset, &c.

Evanid colours are also called *fantastical* and *emphatical* colours.

EVANTES, in antiquity, the priestesses of Bacchus, thus called, because in celebrating the orgia they ran about as if distracted, crying, *Evan, evan, ohé evan*. See BACCHANALIA.

EVAPORATION, in *Natural Philosophy*, signifies the conversion of fluids, principally water, into vapour, so that it becomes specifically lighter than the atmosphere. See CHEMISTRY and METEOROLOGY *Index*.

EVASION, in *Law*, is used for any subtle endeavour to set aside truth, or to escape the punishment of the law, which will not be endured. Thus, if a person says to another that he will not strike him, but will give him a pot of ale to strike him first, and accordingly he strikes, the returning of it is punishable; for no man shall evade the justice of the law by such a pretence to cover his malice.

EVATES, a branch or division of the druids, or ancient Celtic philosophers. Strabo divides the British and Gaulish philosophers into three sects; bards, evates, and druids. He adds, that the bards were the poets and musicians; the evates, the priests and naturalists; and the druids were moralists as well as naturalists: But Marcellus and Hornius reduce them all to two sects, viz. the BARDS and DRUIDS.

EUBAGES, an order of priests or philosophers among the ancient Celtae or Gauls: some will have the eubages to be the same with the druids and saronidæ of Diodorus; and others, that they were the same with what Strabo calls EVATES.

EUBCEA, in *Ancient Geography*, an oblong island, stretching out between Attica and Thessaly, opposite to Bœotia; from which it is separated by a narrow strait called *Euripus*. This island, never exceeding 40, nor ever falling short of two miles in breadth, is in length 150 miles, and in compass 365, according to Pliny. Now NEGROPONT, from its principal town, which was anciently called *Chalcis*.

EUCCHARIST, the sacrament of the Lord's supper, properly signifies *giving thanks*.—The word in its original Greek, *Ευχαριστια*, literally imports *thanksgiving*; being formed of *ευ, bene*, "well," and *χαρις, gratia*, "thanks."

This sacrament was instituted by Christ himself; and the participation of it is called *communion*.

As to the manner of celebrating the eucharist among the ancient Christians, after the customary oblations were made, the deacon brought water to the bishops and presbyters, standing round the table, to wash their hands; according to that of the psalmist, "I will wash my hands in innocency, and so will I compass thy altar, O Lord." Then the deacon cried out aloud, "Mutually embrace and kiss each other;" which being done, the whole congregation prayed for the uni-

versal peace and welfare of the church, for the tranquillity and repose of the world, for the prosperity of the age, for wholesome weather, and for all ranks and degrees of men. After this followed mutual salutations of the minister and people; and then the bishop or presbyter having sanctified the elements by a solemn benediction, he brake the bread, and delivered it to the deacon, who distributed it to the communicants, and after that the cup. Their sacramental wine was usually diluted or mixed with water. During the time of administration, they sang hymns and psalms; and having concluded with prayer and thanksgiving, the people saluted each other with a kiss of peace, and so the assembly broke up.

EUCHITES, or EUCHITÆ, a sect of ancient heretics, who were first formed into a religious body towards the end of the fourth century, though their doctrine and discipline subsisted in Syria, Egypt, and other eastern countries, before the birth of Christ; they were thus called because they prayed without ceasing, imagining that prayer alone was sufficient to save them. Their great foundation were those words of St Paul, (Thessalonians v. 17.), *Pray without ceasing*. The word is formed of the Greek, *ευχη, prayer*, whence *ευχισταί*, the same with the Latin, *precatores*, "prayers." They were also called *Enthusiasts* and *Messalians*; a term of Hebrew origin, denoting the same as Euchites.

The Euchites were a sort of mystics, who imagined, according to the oriental notion, that two souls resided in man, the one good and the other evil; and who were zealous in expelling the evil soul or demon, and hastening the return of the good spirit of God, by contemplation, prayer, and singing of hymns. They also embraced the opinions nearly resembling the Manichean doctrine, and which they derived from the tenets of the oriental philosophy. The same denomination was used in the 12th century, to denote certain fanatics who infested the Greek and eastern churches, and who were charged with believing a double Trinity, rejecting wedlock, abstaining from flesh, treating with contempt the sacraments of baptism and the Lord's supper, and the various branches of external worship, and placing the essence of religion solely in external prayer, and maintaining the efficacy of perpetual supplications to the supreme Being for expelling an evil being or genius, which dwelt in the breast of every mortal. This sect is said to have been founded by a person called *Lucopetrus*, whose chief disciple was named *Tychicus*. By degrees it became a general and invidious appellation for persons of eminent piety and zeal for genuine Christianity, who opposed the vicious practices and insolent tyranny of the priesthood; much in the same manner as the Latins comprehended all the adversaries of the Roman pontiff under the general terms of WALDENSES and ALBIGENSES.

St Cyril of Alexandria, in one of his letters, takes occasion to censure several monks in Egypt, who, under pretence of resigning themselves wholly to prayer, led a lazy, scandalous life. A censure likewise applicable to monasteries in general.

EUCHOLOGIUM, *Ευχολογιον*, a Greek term, signifying literally a *discourse on prayer*. The word is formed of *ευχη, prayer*, and *λογος, discourse*.

The Euchologium is properly the Greek ritual, wherein are prescribed the order and manner of every thing

Euchites
||
Euchologium.

Euclid
||
Eudofia.

thing relating to the order and administration of their ceremonies, sacraments, ordinations, &c.

F. Goar has given us an edition of the Greek Eudologium in Greek and Latin, with notes, at Paris.

EUCCLID of MEGARA, a celebrated philosopher and logician, flourished about 400 B. C. The Athenians having prohibited the Megareans from entering their city on pain of death, this philosopher disguised himself in women's clothes to attend the lectures of Socrates. After the death of Socrates, Plato and other philosophers went to Euclid at Megara, to shelter themselves from the tyrants who governed Athens. Euclid admitted but one chief good; which he sometimes called *God*, sometimes *Spirit*, and sometimes *Providence*.

EUCCLID of Alexandria, the celebrated mathematician, flourished in the reign of Ptolemy Lagus, about 277 B. C. He reduced all the fundamental principles of pure mathematics, which had been delivered down by Thales, Pythagoras, Eudoxus, and other mathematicians before him, into regularity and order, and added many others of his own discovering; on which account he is said to be the first who reduced arithmetic and geometry into the form of a science. He likewise applied himself to the study of mixed mathematics, and especially to astronomy, in which he also excelled. The most celebrated of his works is his Elements of Geometry, of which there have been a great number of editions in all languages; and a fine edition of all his works was printed in 1703, by David Gregory, Savilian professor of astronomy at Oxford.

EUCRASYS, (of *eu*, *well*, and *κρασις*, *temperature*), in *Medicine*, an agreeable well-proportioned mixture of qualities, whereby a body is said to be in good order, and disposed for a good state of health.

EUDIOMETER, an instrument for ascertaining the purity of the atmospherical air, or the quantity of pure oxygen or vital air contained in it, chiefly by means of its diminution, or the absorption of it by exposing certain substances to its action. Several kinds of these have been invented. See *CHEMISTRY Index*.

EUDOSIA, (ATHENIA, before her conversion to Christianity), a celebrated lady, the daughter of Leontius, a philosopher of Athens; who gave her such a learned education, that at his death, he left her only a small legacy, saying she was capable to make her own fortune: but pleading at Athens without success against her two brothers, for a share in her father's estate, she carried her cause personally by appeal to Constantinople; recommended herself to Pulcheria, the sister of the emperor Theodosius the younger; embraced Christianity, was baptized by the name of *Eudofia*, and soon after married to the emperor. Their union lasted a considerable time: but a difference at last taking place, on account of the emperor's jealousy, excited by Chryfapius the eunuch, she retired to Jerusalem, where she spent many years in building and adorning churches and in relieving the poor. Dupin says, that she did not return thence till after the emperor's death: but Cave tells us, that she was reconciled to him, returned to Constantinople, and continued with him till his death; after which she went again to Palestine, where she spent the remainder of her life in pious works. She died in the year 460, according to Dupin; or 459, according to Cave: the latter observes, that on her deathbed she took a solemn oath, by which

she declared herself entirely free from any stains of un-Eudoxians chastity. She was the author of a paraphrase on the eight first books of the Old Testament in heroic verse; and of a great number of poems, which are lost.

EUDOXIANS, a party or sect of heretics in the fourth century, so denominated from their leader Eudoxius, patriarch of Antioch and Constantinople, a great defender of the Arian doctrine. The Eudoxians adhered to the errors of the Arians and Eunomians, maintaining, that the Son was created out of nothing; that he had a will distinct and different from that of the Father, &c.

EVE. See VIGIL.

EVE, the mother of all mankind; who being deluded by the serpent, occasioned the fall, and all its dismal consequences. See ADAM.

EVELYN, JOHN, a most learned and ingenious writer and natural philosopher, was born at Wotton in Surry, the seat of his father, in 1620. After making the tour of Europe, he returned to England about the year 1651, and lived very retired at his rural retreat, Say's Court, near Deptford in Kent; where his disgust at the violence and confusion of the times operated so far upon his studious disposition, that he actually proposed to Mr Boyle the establishing a kind of college for persons of the same turn of mind, where they might associate together without care or interruption. It was owing to Mr Evelyn's gratitude to the place of his education, that Oxford became possessed of the famous Arundelian marbles; which he persuaded the Lord Henry Howard to bestow on that university. He was very assiduous in transmitting to the Royal Society whatever fell within the compass of his inquiries; and used humbly to style himself *a pioneer in the service*. When the number of books he published is considered, the many he left behind him unfinished and unpublished, and the variety of subjects on which he employed his time, his industry and application are astonishing. "His life (says the honourable Mr Walpole) was a course of inquiry, study, curiosity, instruction, and benevolence. The works of the Creator, and the mimic labours of the creature, were all objects of his pursuit. He unfolded the perfections of the one, and assisted the imperfections of the other. He adored from examination; was a courtier that flattered only by informing his prince, and by pointing out what was worthy for him to countenance; and was really the neighbour of the Gospel, for there was no man that might not have been the better for him. He was one of the first promoters of the Royal Society, a patron of the ingenious and indigent, and peculiarly serviceable to the lettered world; for, besides his writings and discoveries, he obtained the Arundelian marbles for the university of Oxford, and the Arundelian library for the Royal Society: nor is it the least part of his praise, that he who proposed to Mr Boyle the erection of a philosophic college for retired and speculative persons, had the honesty to write in defence of active life against Sir George Mackenzie's Essay on Solitude. He knew that retirement in his own hands was industry and benefit to mankind; but in those of others, laziness and inutility." There are five small prints of this gentleman's journey from Rome to Naples, drawn and etched by him; and among his published works are, 1. A Character of England; 2. The State of France; 3. An Essay on the

Eudoxians
||
Evelyn.

Evergetes the first book of Lucretius *De rerum natura*: 4. The French gardener; 5. A Panegyric on King Charles II's coronation; 6. *Fumifugum*, or the inconvenience of the air and smoke of London dissipated; 7. The History and Art of Engraving on Copper; 8. A parallel between the ancient architecture and the modern; 9. *Sylva*, or a discourse of forest trees; and several others. This amiable gentleman died, full of age and honour, in 1706. His son John Evelyn, born in 1654, distinguished himself by his elegant translations and poems: He was one of the commissioners of the revenue in Ireland; but died early in life, in 1698.

EVERGETES, a surname signifying *benefactor*, given to Philip of Macedon, and to Antigonus Dofon, and Ptolemy of Egypt. It was also commonly given to the kings of Syria and Pontus, and we often see among the former an Alexander Evergetes, and among the latter a Mithridates Evergetes. Some of the Roman emperors also claimed that epithet of Benevolent and Humane.

EVERGREEN, in *Gardening*, a species of perennials, which continue their verdure, leaves, &c. all the year: such are hollies, phillyreas, lauristinufes, bays, pines, firs, cedars of Lebanon, &c.

EVERLASTING PEA. See LATHYRUS, BOTANY Index.

EVES-DROPPERS. See *EAVES-Droppers*.

EVESHAM, or EVESHOLM, commonly called *E-fam*, a town of Worcestershire, seated on a gentle ascent from the river Avon, over which there is a bridge of seven arches. It is 95 miles from London, 14 miles from Worcester, and has a harbour for barges. It is an old borough, reckoned the second in the county; and sends two members to parliament. It had formerly an abbey with a mitred abbot; which abbey when standing was one of the largest and most stately of any in the kingdom. It was governed by a bailiff, till King James I. at the request of his son Prince Henry, gave it a charter for a mayor, 7 aldermen, 12 capital burgesses, a recorder, and chamberlain, who are all of the common council, with 24 other burgesses called assistants. Four of the aldermen, and the mayor for the time being, are justices of the peace; and of oyer and terminer, and of gaol delivery, for all offences in the corporation, except high treason; and the corporation has power to try and execute felons within the borough. Here are two parish-churches; but the bells of both have been removed to a beautiful old tower which was one of the gates of the abbey. The town is noted for the great victory obtained near it by Prince Edward, afterwards King Edward I. over Simon Montfort, the great earl of Leicester, who was killed in the battle. There is an open prospect from hence of the spacious valley called the *vale of Evesham* or *vale of Gloucester*, which so abounds with the best of corn, as well as pasture for sheep, that it is reckoned the granary of all these parts. The vale runs all along the banks of the Avon, from Tewkesbury to Perihore, and Stratford in Warwickshire, and the river is so far navigable. It has a weekly market and four fairs. The market-house built by Sir Edward Hobby has its upper apartments used by the corporation for a sessions-house, and formerly for the assizes of the county. There are considerable garden grounds around the place, the produce of which supplies the adjacent towns.

EUGENE, FRANCIS, prince of Savoy, descended from Carignan, one of the three branches of the house of Savoy, and son of Eugene Maurice, general of the Swiss and Grisons, governor of Champagne, and earl of Soissons, was born in 1663. Louis XIV. to whom he became afterwards so formidable an enemy, thought him so unpromising a youth, that he refused him preferment both in the church and the state, thinking him too much addicted to pleasure to be useful in either. Prince Eugene, in disgust, quitted France; and, retiring to Vienna, devoted himself to the Imperial service. The war between the emperor and the Turks afforded the first opportunity of exerting his military talents; and every campaign proved a new step in his advancement to the highest offices in the army. He gave the Turks a memorable defeat at Zenta; commanded the German forces in Italy, where he foiled Marshal Villeroy in every engagement, and at length took him prisoner. Our limits do not allow a detail of his campaigns; but Prince Eugene distinguished himself greatly, when the emperor and Queen Anne united against the exorbitant power of Louis XIV. He died at Vienna in the year 1736; and was as remarkable for his modesty and liberality, as for his abilities in the field and the cabinet.

EUGENIA, the YAMBOO: A genus of plants, belonging to the icofandria class; and in the natural method ranking under the 19th order, *Hesperideae*. See BOTANY Index.

EVICITION, in *Law*, signifies a recovery of lands or tenements by law.

EVIDENCE, that perception of truth which arises either from the testimony of the senses or from an induction of reason.

EVIDENCE, in *Law*, signifies some *proof* by testimony of men upon oath, or by writings or records. It is called *evidence*, because thereby the point in issue in a cause to be tried is to be made *evident* to the jury; for *probationes debent esse evidentes et perspicue*. The system of evidence, as now established in our courts of common law, is very full, comprehensive, and refined; far different from, and superior to, any thing known in the middle ages;—as far superior in that as in all other improvements and refinements in science, arts, and manners.

The nature of evidence during the ages of ignorance was extremely imperfect, and the people were incapable of making any rational improvement. Thus it was the imperfection of human reason that caused the invention and introduction of the ORDEAL, as an appeal to the Supreme Being. As men are unable to comprehend the manner in which the Deity carries on the government of the universe, by equal, fixed, and general laws, they are apt to imagine, that in every case which their passions or interest render important in their own eyes, the Supreme Ruler of all ought visibly to display his power in vindicating innocence, and punishing vice.

EVIL, in *Philosophy*, &c. is either moral or natural. Moral evil is the disagreement between the actions of a moral agent, and the rule of those actions whatever it is*.—Natural evil is, whatever destroys or * See *Moral Philosophy*. as blindness, diseases, death, &c.

King's EVIL, or *Scrophula*. See MEDICINE Index.

EVIL-Merodach, the son and successor of Nebuchadnezzar

Evergetes
||
Evesham.

Eugene
||
Evil.

Euler.

nezzar the great, king of Babylon, succeeded to the crown in the year of the world 3443; but governed the kingdom during the indisposition of his father, who, after seven years, having recovered his understanding, once more ascended the throne; and, as some believe, imprisoned his son Evil-Merodach. In this confinement it is supposed that Evil-Merodach made an acquaintance and friendship with Jehoiachim king of Judah, who had been carried to Babylon by Nebuchadnezzar. However that was, it is certain, that, soon after his succession to the throne, he delivered the king of Judah out of prison, after a confinement of 37 years, heaped many favours on him, and placed him above all the other kings who were at the court of Babylon, (2 Kings xxv. 27. Jer. lii. 31.) Evil-Merodach reigned but one year, according to the chronology of Archbishop Usher; but Dr Prideaux will have him to have reigned two years; and was succeeded by Neriglissar his sister's husband, who having been at the head of a conspiracy that put him to death, reigned in his stead. Others will have it, that this prince was immediately succeeded by his son BEL-SHAZZAR.

EULER, LEONARD, professor of mathematics, member of the imperial academy of Petersburg, ancient director of the royal academy of Berlin, and fellow of the royal society of London, as also correspondent member of the royal academy of sciences at Paris, was born at Basil, April 15. 1707, of reputable parents. The years of his infancy were passed in a rural retreat at the village of Riehen, of which place his father was minister.—Being sent to the university of Basil, he attended regularly the different professors. As his memory was prodigious, he performed his academical tasks with uncommon rapidity; and all the time he gained by this was consecrated to geometry, which soon became his favourite study. The early progress he made in this science, only added new ardour to his application; and thus he obtained a distinguished place in the attention and esteem of Professor John Bernouilli, who was at that time one of the first mathematicians in Europe. In 1723, M. Euler took his degree as master of arts; and delivered on that occasion a Latin discourse, in which he drew a comparison between the philosophy of Newton and the Cartesian system, which was received with the greatest applause. He afterwards, at his father's desire, applied himself to the study of theology, and the oriental languages. Though these studies were foreign to his predominant propensity, his success was considerable even in this line: however, with his father's consent, he returned to geometry as his principal object. He continued to avail himself of the counsels and instructions of M. Bernouilli; he contracted an intimate friendship with his two sons Nicholas and Daniel; and it was in consequence of these connexions that he became afterwards the principal ornament of the academy of Petersburg. The project of erecting this academy, which had been formed by Peter the Great, was executed by Catherine I.; and the two young Bernouillis being invited to Petersburg in 1725, promised Euler, who was desirous of following them, that they would use their utmost endeavours to procure for him an advantageous settlement in that city. In the mean time, by their advice, he applied himself with ardour to the study of

physiology, to which he made a happy application of his mathematical knowledge; and he attended the medical lectures of the most eminent professors of Basil. This study, however, did not wholly engross his time: it did not even relax the activity of his vast and comprehensive mind in the cultivation of other branches of natural science. For while he was keenly engaged in physiological researches, he composed A Dissertation on the Nature and Propagation of Sound, and an answer to a prize question concerning the masting of ships; to which the academy of sciences adjudged the *accessit*, or second rank, in the year 1727. From this latter discourse, and other circumstances, it appears that Euler had early embarked in the curious and important study of navigation, which he afterwards enriched with so many valuable discoveries.

M. Euler's merit would have given him an easy admission to honourable preferment, either in the magistracy or university of his native city, if both civil and academical honours had not been there distributed by lot. The lot being against him in a certain promotion, he left his country, set out for Petersburg, and was made joint professor with his countrymen Messrs Hermann and Daniel Bernouilli in the university of that city. At his first setting out in his new career, he enriched the academical collection with many memoirs, which excited a noble emulation between him and the Bernouillis: and this emulation always continued, without either degenerating into a selfish jealousy, or producing the least alteration in their friendship. It was at this time that he carried to new degrees of perfection the integral calculus, invented the calculation of sines, reduced analytical operations to a greater simplicity, and thus was enabled to throw new light on all the parts of mathematical science. In 1730, he was promoted to the professorship of natural philosophy; and in 1733 he succeeded his friend D. Bernouilli in the mathematical chair. In 1735, a problem was proposed by the academy which required expedition, and for the solution of which several eminent mathematicians had demanded the space of some months. The problem was solved by Euler in three days, to the great astonishment of the academy; but the violent and laborious efforts it cost him threw him into a fever, which endangered his life, and deprived him of the use of his right eye. The academy of sciences at Paris, which in 1738 had adjudged the prize to his memoir Concerning the Nature and Properties of Fire, proposed for the year 1740 the important subject of the sea tides; a problem whose solution required the most arduous calculations, and comprehended the theory of the solar system. Euler's discourse on this question was adjudged a masterpiece of analysis and geometry; and it was more honourable for him to share the academical prize with such illustrious competitors as Colin Maclaurin and Daniel Bernouilli, than to have carried it away from rivals of less magnitude. Rarely, if ever, did such a brilliant competition adorn the annals of the academy; and no subject, perhaps, proposed by that learned body was ever treated with such accuracy of investigation and force of genius, as that which here displayed the philosophical powers of these three extraordinary men.

In the year 1741, M. Euler was invited to Berlin to augment the lustre of the academy, that was there rising.

Euler.

Euler.

rising into fame. He enriched the last volume of the miscellanies (*melanges*), of Berlin with five memoirs, which make an eminent, perhaps the principal, figure in that collection. These were followed with an astonishing rapidity by a great number of important researches, which are scattered through the memoirs of the Prussian academy; of which a volume has been regularly published every year since its establishment in 1744. The labours of Euler will appear more especially astonishing, when it is considered, that while he was enriching the academy of Berlin with a prodigious number of memoirs, on the deepest parts of mathematical science, containing always some new points of view, often sublime truths, and sometimes discoveries of great importance; he did not discontinue his philosophical contributions to the academy of Peterburgh, which granted him a pension in 1742, and whose memoirs display the marvellous fecundity of Euler's genius. It was with much difficulty that this great man obtained, in 1766, permission from the king of Prussia to return to Petersburgh, where he desired to pass the rest of his days. Soon after his return, which was graciously rewarded by the munificence of Catherine II. he was seized with a violent disorder, which terminated in the total loss of his sight. A cataract, formed in his left eye, which had been essentially damaged by a too ardent application to study, deprived him entirely of the use of that organ. It was in this distressing situation that he dictated to his servant, a tailor's apprentice, who was absolutely devoid of mathematical knowledge, his elements of algebra; which by their intrinsic merit, in point of perspicuity and method, and the unhappy circumstances in which they were composed, have equally excited applause and astonishment. This work, though purely elementary, discovers the palpable characteristics of an inventive genius; and it is here alone that we meet with a complete theory of the analysis of Diophantus.

About this time M. Euler was honoured by the Academy of Sciences at Paris with the place of one of the foreign members of that learned body; and, after this, the academical prize was adjudged to three of his memoirs, Concerning the Inequalities in the Motions of the Planets. The two prize questions proposed by the same academy for 1770 and 1772 were designed to obtain from the labours of astronomers a more perfect theory of the moon. M. Euler, assisted by his eldest son, was a competitor for these prizes, and obtained them both. In this last memoir, he reserved for farther consideration several inequalities of the moon's motion, which he could not determine in his first theory, on account of the complicated calculations in which the method he then employed had engaged him. He had the courage afterward to review his whole theory, with the assistance of his son and Messrs Kraft and Lexell, and to pursue his researches until he had constructed the new tables, which appeared, together with the great work, in 1772. Instead of confining himself as before, to the fruitless integration of three differential equations of the second degree, which are furnished by mathematical principles, he reduced them to the three ordinates, which determine the place of the moon; he divided into classes all the inequalities of that planet, as far as they depend either on the elongation of the sun and moon, or upon the eccentricity,

or the parallax, or the inclination of the lunar orbit. All these means of investigation, employed with such art and dexterity as could only be expected from analytical genius of the first order, were attended with the greatest success; and it is impossible to observe, without admiration, such immense calculations on the one hand, and on the other the ingenious methods employed by this great man to abridge them, and to facilitate their application to the real motion of the moon. But this admiration will become astonishment, when we consider at what period and in what circumstances all this was effectuated by M. Euler. It was when he was totally blind, and consequently obliged to arrange all his computations by the sole powers of his memory and his genius. It was when he was embarrassed in his domestic circumstances by a dreadful fire, that had consumed great part of his substance, and forced him to quit a ruined house, of which every corner was known to him by habit, which, in some measure, supplied the place of sight. It was in these circumstances that Euler composed a work, which, alone, was sufficient to render his name immortal. The heroic patience and tranquillity of mind which he displayed here, needs no description: and he derived them not only from the love of science, but from the power of religion. His philosophy was too genuine and sublime to stop its analysis at mechanical causes; it led him to that divine philosophy of religion which ennobles human nature, and can alone form a habit of true magnanimity and patience in suffering.

Some time after this, the famous Wenzell, by couching the cataract, restored M. Euler's sight; but the satisfaction and joy that this successful operation produced, were of short duration. Some instances of negligence on the part of his surgeons, and his own impatience to use an organ, whose cure was not completely finished, deprived him of his sight a second time; and this relapse was accompanied with tormenting pain. He, however, with the assistance of his sons, and of Messrs Kraft and Lexell, continued his labours; neither the loss of his sight, nor the infirmities of an advanced age, could damp the ardour of his genius. He had engaged to furnish the academy of Peterburgh with as many memoirs as would be sufficient to complete its acts for 20 years after his death. In the space of seven years he transmitted to the academy by Mr Golfwin, above 70 memoirs, and above 200 more, which were revised and completed by the author of this paper. Such of these memoirs as were of ancient date were separated from the rest, and form a collection that was published in the year 1783, under the title of *Analytical Works*.

Euler's knowledge was more universal than could be well expected in one who had pursued with such unremitting ardour mathematics and astronomy as his favourite studies. He had made a very considerable progress in medical, botanical, and chemical science. What was still more extraordinary, he was an excellent scholar, and possessed what is generally called *erudition* in a very high degree. He had, read with attention and taste, the most eminent writers of ancient Rome; the civil and literary history of all ages and all nations was familiar to him; and foreigners, who were only acquainted with his works, were astonished to find

Euler.

Eulogy
||
Eumenes.

find in the conversation of a man, whose long life seemed solely occupied in mathematical and physical researches and discoveries, such an extensive acquaintance with the most interesting branches of literature. In this respect, no doubt, he was much indebted to a very uncommon memory, which seemed to retain every idea that was conveyed to it, either from reading or from meditation. He could repeat the *Æneid* of Virgil, from the beginning to the end, without hesitation, and indicate the first and last line of every page of the edition he used.

Several attacks of a vertigo, in the beginning of September 1783, which did not prevent his calculating the motions of the aerostatical globes, were, nevertheless, the forerunners of his mild and happy passage from this scene to a better. While he was amusing himself at tea with one of his grandchildren, he was struck with an apoplexy, which terminated his illustrious career at the age of 76. His constitution was uncommonly strong and vigorous; his health was good; and the evening of his long life was calm and serene, sweetened by the fame that follows genius, the public esteem and respect that are never withheld from exemplary virtue, and several domestic comforts which he was capable of feeling and therefore deserved to enjoy.

EULOGY, EULOGIA, in church history. When the Greeks have cut a loaf or piece of bread to consecrate it, they break the rest into little bits, and distribute it among the persons who have not yet communicated, or send it to persons that are absent; and these pieces of bread are what they call *eulogies*. The word is Greek, *εὐλογία*, formed of *εὐ*, *bene*, "well," and *λογω*, *dico*, "I say, speak;" q. d. *benedictum*, "blessed."

The Latin church has had something like eulogies for a great many ages; and thence arose the use of their holy bread.

The name *eulogy* was likewise given to loaves or cakes brought to church by the faithful to have them blessed.

Lastly, The use of the term passed hence to mere presents made to a person without any benediction. See the Jesuit Gretser, in his treatise *de Benedictionibus et Maledictionibus*, lib. ii. cap. 22, 24, &c. where he treats of eulogies thoroughly.

From a passage in Bolandus, on the life of St Melaine, cap. 4. it appears, that eulogies were not only of bread, but any kind of meat blessed and hallowed for that purpose. Add, that almost every body blessed and distributed eulogies; not only bishops and priests, but even hermits, though laymen, made a practice of it. Women also would sometimes send eulogies.

The wine sent as a present was also held an eulogy. Bolandus remarks farther, that the eucharist itself was also called *eulogy*.

EULOGY, likewise means an encomium on any person, on account of some virtue or good quality.

EUMARIDES, of *εὐμαρις*, "easy," among the ancients, a kind of shoes common to men and women.—The eumarides were used for pomp and delicacy, being neat, and painted with various colours.

EUMENES, a Greek officer in the army of Alexander, son of a charioteer. He was the most worthy of all the officers of Alexander to succeed after the death of his master. He conquered Paphlagonia, and

Cappadocia, of which he obtained the government, till the power and jealousy of Antigonus obliged him to retire. He joined his forces to those of Perdiccas, and defeated Craterus and Neoptolemus. Neoptolemus perished by the hands of Eumenes. When Craterus had been killed during the war, his remains received an honourable funeral from the hand of the conqueror; and Eumenes, after weeping over the ashes of a man who was once his dearest friend, sent his remains to his relations in Macedonia. Eumenes fought against Antipater and conquered him; and after the death of Perdiccas his ally, his arms were directed against Antigonus, by whom he was conquered A. U. C. 433, chiefly by the treacherous conduct of his officers. This fatal battle obliged him to disband the greatest part of his army to secure himself a retreat; and he fled with only 700 faithful attendants to a fortified place on the confines of Cappadocia, called *Nora*, where he was soon besieged by the conqueror. He supported the siege for a year with courage and resolution, but some disadvantageous skirmishes so reduced him, that his soldiers, grown desperate, and bribed by the offers of the enemy, had the infidelity to betray him into the hands of Antigonus. The conqueror, from shame or remorse, had not the courage to visit Eumenes; but when he was asked by his officers, in what manner he wished him to be kept, he answered, keep him as carefully as you would keep a lion. This severe command was obeyed; but the asperity of Antigonus vanished in a few days, and Eumenes, delivered from the weight of chains, was permitted to enjoy the company of his friends. Even Antigonus hesitated whether he should not restore to his liberty a man with whom he had lived in the greatest intimacy while both subservient to the command of Alexander; and these secret emotions of pity and humanity were not a little increased by the petitions of his son Demetrius for the release of Eumenes. But the calls of ambition prevailed; and when Antigonus recollected what an active enemy he had in his power, he ordered Eumenes to be put to death in the prison. His bloody commands were executed 315 years before the Christian era. Such was the end of a man who raised himself to power by merit alone. His skill in public exercises first recommended him to the notice of Philip; and under Alexander, his attachment and fidelity to the royal person, and particularly his military accomplishments, promoted him to the rank of a general. Even his enemies revered him; and Antigonus, by whose orders he perished, honoured his remains with a splendid funeral, and conveyed his ashes to his wife and family in Cappadocia. It has been observed, that Eumenes had such a universal influence over the successors of Alexander, that none during his lifetime dared to assume the title of king.

EUMENES I. king of Pergamus, who succeeded his uncle Philetærus about 264 years before Christ. He made war against Antiochus the son of Seleucus, and enlarged his possessions by seizing upon many of the cities of the kings of Syria. He lived in alliance with the Romans, and made war against Prusias king of Bithynia. He was a great patron of learning; but being much given to wine, he died of an excess in drinking, after a reign of 22 years. He was succeeded by Attalus.

EUMENES

^{Eumenes}
^{Eumolpides} EUMENES II. succeeded his father Attalus on the throne of Asia and Pergamus. His kingdom was small and poor, but he rendered it powerful and opulent; and his alliance with the Romans did not a little contribute to the increase of his dominions after the victories obtained over Antiochus the Great. He carried his arms against Prusias and Antigonus; and died 160 years before Christ, after a reign of 40 years, leaving the kingdom to his son Attalus II. He has been admired for his benevolence and magnanimity; and his love of learning greatly enriched the famous library of Pergamus, which had been founded by his predecessors in imitation of the Alexandrian collection of the Ptolemies. His brothers were so attached to him and devoted to his interest, that they enlisted among his body guards to show their fraternal fidelity.

EUMENES, a celebrated orator of Athens about the beginning of the fourth century. Some of his harangues and orations are extant. An historical writer in Alexander's army.

EUMENIDES, a name given to the Furies by the ancients. They sprang from the blood of the wound which Cœlus received from his son Saturn. According to others, they were daughters of Earth, and conceived from the blood of Saturn. Some make them daughters of Acheron and Night, or Pluto and Proserpine. According to the more received opinions, they were three in number, Tisiphone, Megara, and Alesto, to which some add Nemesis. Plutarch mentions only one called *Adrasta*, daughter of Jupiter and Necessity. They were supposed to be the ministers of the vengeance of the gods. They were stern and inexorable; and were always employed in punishing the guilty upon earth, as well as in the infernal regions. They inflicted their vengeance upon earth by wars, pestilence, and dissensions, and by the secret stings of conscience; and in hell they punished the guilty by continual flagellation and torments. They were also called *Furie* and *Erinnys*. Their worship was almost universal; and people dared not to mention their names or fix their eyes upon their temples. They were honoured with sacrifices and libations; and in Achaia they had a temple, which when entered by any one guilty of a crime, suddenly rendered him furious and deprived him of the use of his reason. In the sacrifices the votaries used branches of cedar and of alder, hawthorn, saffron, and juniper; and the victims were generally turtle doves and sheep, with libations of wine and honey. They were usually represented with a grim and frightful aspect, with a black and bloody garment, and with serpents writhing round their heads instead of hair. They held a burning torch in one hand, and a whip of scorpions in the other; and were always attended by Terror, Rage, Paleness, and Death. In hell they were seated around Pluto's throne, as the ministers of his vengeance.

EUMENIDIA, festivals in honour of the Eumenides, called by the Athenians *σεβαστα θεαι*, "venerable goddesses." They were celebrated once every year, with sacrifices of pregnant ewes, with offerings of cakes made by the most eminent youths, and libations of honey and wine. At Athens none but freeborn citizens were admitted, such as had led a life the most virtuous and unfulfilled.

EUMOLPIDES, the priests of Ceres at the cele-

VOL. VIII. Part I.

bration of her festivals at Eleufis. They were descended from Eumolpus, a king of Thrace, who was made priest of Ceres by Erechtheus king of Athens. He became so powerful after his appointment to the priesthood, that he maintained a war against Erechtheus. This war proved fatal to both. Erechtheus and Eumolpus were both killed, and peace was re-established among their descendants, on condition that the priesthood ever remained in the house of Eumolpus, and the regal power in the family of Erechtheus. The priesthood remained in the family of Eumolpus for 1200 years; and this is still more remarkable, because he who was once appointed to the holy office was obliged to remain in perpetual celibacy.

EUMOLPUS, a king of Thrace, son of Neptune and Chione. He was thrown into the sea by his mother, who wished to conceal her shame from her father. Neptune saved his life and carried him into Æthiopia, where he was brought up by a woman, one of whose daughters he married. An act of violence to his sister-in-law obliged him to leave Æthiopia, and he fled to Thrace with his son Ismarus, where he married the daughter of Tegyrius the king of the country. This connexion to the royal family rendered him ambitious; he conspired against his father-in-law, and fled, when the conspiracy was discovered, to Attica, where he was initiated in the mysteries of Ceres of Eleufis, and made hierophantes or high priest. He was afterwards reconciled to Tegyrius, and inherited his kingdom. He made war against Erechtheus king of Athens, who had appointed him to the office of high priest, and perished in battle about 1380 years before the Christian era. His descendants were also invested with the priesthood, which remained for about 1200 years in that family.

EUNAPIUS, a native of Sardis in Lydia, a celebrated sophist, physician, and historian, who flourished in the 4th century, under the emperors Valentinian, Valens, and Gratian. He wrote "The Lives of the Philosophers and Sophists," in which he frequently shows himself a bitter enemy to the Christians: also a "History of the Cæsars," which he deduced from the reign of Claudius where Herodian left off, down to that of Arcadius and Honorius. The history is lost; but we have the substance of it in Zosimus, who is supposed to have done little more than copy it.

EUNOMIANS, in church history, Christian heretics in the 4th century. They were a branch of Arians, and took their name from Eunomius bishop of Cyzicus, whose confession of faith here follows, extracted from Cave's *Historia Literaria*, vol. i. p. 223. "There is one God, uncreated and without beginning; who has nothing existing before him, for nothing can exist before what is uncreated; nor with him, for what is uncreated must be one; nor in him, for God is a simple and uncompounded being. This one simple and eternal being is God, the creator and ordainer of all things; first indeed and principally of his only-begotten Son; and then, through him, of all other things. For God begot, created, and made, the Son, only by his direct operation and power, before all things, and every other creature; not producing, however, any being like himself, or imparting any of his own proper substance to the Son: For God is immortal, uniform, indivisible; and therefore cannot communicate any part

Eunomius,
Eunuch.

of his own proper substance to another. He alone is unbegotten; and it is impossible that any other being should be formed of an unbegotten substance. He did not use his own substance in begetting the Son, but his will only: nor did he beget him in the likeness of his substance, but according to his own good pleasure. He then created the Holy Spirit, the first and greatest of all spirits, by his own power indeed and operation mediately, yet by the immediate power and operation of the Son. After the Holy Spirit he created all other things in heaven and in earth, visible and invisible, corporeal and incorporeal, mediately by himself, by the power and operation of the Son," &c.

EUNOMIUS, a famous heresiarch of the 4th century, the disciple of Elius, but abundantly more subtle than his master, as well as more bold in propagating the opinions of his sect, who after him are called *Eunomians*. He was ordained bishop of Cyzicus; but gave so much disturbance by the intemperance of his zeal, that he was deposed more than once. At last, tired with being tossed about, he petitioned to retreat to the place of his birth, Dacora in Cappadocia; where he died very old about the year 374, after experiencing a variety of sufferings. The greatest part of his works are lost. There is, however, besides two or three small pieces, a confession of his faith remaining, which Cave inserted in his *Historia Literaria*, from a manuscript in Archbishop Tennison's library. See the preceding article.

EUNUCH, a castrated person. See the article CASTRATION.—The word is formed from *ευνν* *εχει*, q. d. *lecti curam habet*, "guardian or keeper of the bed."

In Britain, France, &c. eunuchs are never made but upon occasion of some disease, which renders such an operation necessary; but in Italy they make great numbers of children, from one to three years of age, eunuchs, every year, to supply the operas and theatres of all Europe with singers. M. de la Lande, in his *Voyage d'Italie*, asserts, that there are public shops at Naples where this cruel operation is performed, and that over the door of these shops is inscribed *Qui si castrano ragazzi*. But Dr Burney informs us, that he was not only utterly unable to see or hear of any such shops during his residence in that city, but was constantly told, both by the natives and English settled there, that the laws against such a practice were so numerous and severe, that it was never performed but with the utmost secrecy.

In the eastern parts of the world, they make eunuchs in order to be guards or attendants on their women. The seraglios of the eastern emperors are chiefly served and guarded by eunuchs; and yet, from good authority, we learn, that the rich eunuchs in Persia and other countries keep seraglios for their own use. Those who, out of an imprudent zeal to guard themselves from sensual pleasures, made themselves eunuchs, were, by the council of Nice, condemned and excluded from holy orders. There are several severe prohibitions in Germany against the making of eunuchs; and in France an eunuch must not marry, not even with the consent of the woman.

Though the practice of castration is detestable in every point of view; yet there appears no real foundation for the injurious opinion generally entertained of eunuchs, viz. that they are all cowards, and devoid of genius for literature or any solid study. "As to genius

(says the author last quoted), I never found those of the first class in music deficient in intellectual abilities for more serious studies. Indeed I have seen real genius and dispositions for literary pursuits, in more than one great opera singer; and as for composition, and the theory of music, not only the best singers of the pope's chapel ever since the beginning of the last century, but the best composers, are among the sopranis in that service." With respect to the operation affecting the mind so much as to deprive it of all fortitude in times of danger, there is great reason to doubt the fact: most of the generals of eastern monarchs having been at all times of this class; and the bravest stand that ever was made against Alexander the Great was at Gaza, under the command of one of Darius's generals, who was an eunuch. Ammianus Marcellinus gives an account of Menophilus, a eunuch, to whom Mithridates intrusted his daughter; which proves the possibility of such unfortunate persons possessing a heroism equal to that of the most determined Stoic.

It is very certain, that the ancients never supposed eunuchs to have been men of inferior intellects, or that they possessed less vigour of mind than other men. At least the Persians were not of this opinion; for Herodotus * relates, that when they had taken possession of some Ionian cities, *παίδας τε τας εν ιδεσθαις εκλεγομενοι εξεταμων, και εποισον αυτι εναι ενορχικας ενουχας*. It is certain, however, Herodotus †, in relating the melancholy † story of Hermotimus, says, that *παρα τοσσι βαρβαροις τερ. 668. μεωτεροι εστι εν ενουχοι, πιστας ενεκα πιστης, των ενορχιων*, "among the barbarians, the eunuchs are more valued than other men, on account of their universal fidelity." It appears from this passage of Herodotus, that in Persia eunuchs were far from being objects of contempt; and were even frequently promoted to the highest honours. This was indeed the case with Hermotimus. We find in Agathias, who was one of the Byzantine historians, that a general in the Roman army, named *Naryses*, was a eunuch. This was in the latter ages. In Plutarch's Life of Aristides, Themistocles is related to have chosen an eunuch, whose name was *Arnaces*, from among his prisoners, to send on a secret embassy to Xerxes. This surely may serve to show, that mental imbecility was not supposed by the Greeks to be the characteristic of eunuchism. The same story of the confidence placed in Arnaces, who was one of the Persian king's eunuchs, is related also in the life of Themistocles. Aristotle paid such high respect to Hermias, who was a eunuch and governor of Atarnea, which is in Mysia, that he even offered sacrifices in honour of him; as Lucian informs us in his Dialogue entitled *Eunuchus*. This regard of Aristotle for Hermias has been often celebrated, and is mentioned by Suidas, Harpocration, and others.

EUNUCHS, in church history, a sect of heretics in the third century, who were mad enough to castrate, not only those of their own persuasion, but even all others they could lay hold of. They took their rise from the example of Origen, who, misunderstanding the following words of our Saviour, "and eunuchs who made themselves eunuchs for the kingdom of heaven," castrated himself.

EVOCATI, soldiers among the Romans, who having served their full time in the army, went afterwards volunteers at the request of some favourite general; on which

Eunuch
||
Evocati.

* Lib. vi.
32. p. 451.
Ed. Weffel.
† Lib. viii.
p. 668.

Evocation which account they were called by the honourable names, of *Emeriti* and *Beneficarii*.

||
Eupatridæ.

EVOCATION (*Evocatio*), among the Romans, a religious ceremony always observed by them at the undertaking a siege, wherein they solemnly called upon the gods and goddesses of the place to forsake it and come over to them. Without the performance of this ceremony, they either thought that the place could not be taken, or that it would be a sacrilege to take the gods prisoners. They always took it for granted that their prayer was heard, and that the gods had deserted the place and come over to them, provided they were able to make themselves masters of it.

EUODIA, a genus of plants, belonging to the tetrandria class. See **BOTANY Index**.

EVOLUTION, in *Algebra*, the unfolding or opening of a curve, and making it describe an evolvent.—The word *evolutio* is formed of the preposition *ē*, “out;” and *volvo*, “I roll, or wind;” q. d. an *unwinding*, or *unrolling*.

The equable evolution of the periphery of a circle, or other curve, is such a gradual approach of the circumference to rectitude, as that its parts do all concur and equally evolve or unbend; so that the same line becomes successively a less arc of a reciprocally greater circle; till at last they change into a straight line. In the *Phil. Trans.* N^o 260, a new quadratrix to the circle is found by this means, being the curve described by the equable evolution of its periphery.

EVOLUTION, is also used for the extraction of roots out of powers; in which sense it stands opposed to *involution*. See **ALGEBRA**.

EVOLUTION, in the art of war, the motion made by a body of troops, when they are obliged to change their form and disposition, in order to preserve a post or occupy another, to attack an enemy with more advantage, or to be in a condition of defending themselves the better.

It consists in doublings, counter-marches, conversions, &c. A battalion doubles the ranks, when attacked in front or rear, to prevent its being flanked or surrounded; for then a battalion fights with a larger front. The files are doubled, either to accommodate themselves to the necessity of a narrow ground, or to resist an enemy that attacks them in flank. But if the ground will allow it, conversion is much preferable; because, after conversion, the battalion is in its first form, and opposes the file-leaders, which are generally the best men, to the enemy; and likewise, because doubling the files in a new or not well-disciplined regiment, they may happen to fall into disorder. See **DOUBLING**.

EVOLVULUS, a genus of plants belonging to the pentandria class; and in the natural method ranking under the 29th order, *Campanaceæ*. See **BOTANY Index**.

EUONYMUS, the **SPINDLE TREE**; a genus of plants belonging to the pentandria class; and in the natural method ranking under the 43d order, *Dumoseæ*. See **BOTANY Index**.

EUPATORIUM, **HEMIF AGRIMONY**; a genus of plants belonging to the syngenesia class; and in the natural method ranking under the 49th order, *Compositæ*. See **BOTANY Index**.

EUPATRIDÆ, in antiquity, a name given by Theseus to the nobility of Athens, as distinguished from

the *Geomori* and *Demiurgi*. The *Eupatridæ*, by Theseus's establishment, had the right of choosing magistrates, teaching and dispensing the laws, and interpreting holy and religious mysteries. The whole city, in all other matters, was reduced to an equality. The *Geomori* were husbandmen, and inferior to the *Eupatridæ* in point of fortune; the *Demiurgi* were artificers, and fell short of the *Eupatridæ* in number.

EUPHONY, in *Grammar*, an easiness, smoothness, and elegance of pronunciation. The word is formed of *eu*, *bene*, “well;” and *φων*, *vox*, “voice.” Quintilian calls *euphonia*, “*vocalitas*;” Scaliger, “*facilis pronuntiatio*.”

Euphonia is properly a kind of figure whereby we suppress a too harsh letter, or convert it into a smoother, contrary to the ordinary rules. There are examples enough in all languages.

EUPHYMISM. See **ORATORY**.

EUPHORBIA, **SPURGE**; a genus of plants belonging to the dodecandria class; and in the natural method ranking under the 38th order, *Tricoccæ*. See **BOTANY Index**.

EUPHORBIVM, in the *Materia Medica*, a gummi-resinous substance, which exudes from a large oriental tree, (*EUPHORBIA officinarum*). See **MATERIA MEDICA Index**.

EUPHORBUS, a famous Trojan, son of Panthöus. He was the first who wounded Patroclus, whom Hector killed. He perished by the hand of Menelaus, who hung his shield in the temple of Juno at Argos. Pythagoras, the founder of the doctrine of the metempsychosis or transmigration of souls, affirmed that he had been once Euphorbus, and that his soul recollected many exploits which had been done while it animated that Trojan's body. As a further proof of his assertion, he showed at first sight the shield of Euphorbus in the temple of Juno.

EUPHORION of **CHALCIS**, a poet and historian, born in the 126th Olympiad. Suetonius says that Tiberius composed verses in imitation of Euphorion, Rianius and Parthenius; with whom he was charmed to such a degree, that he ordered their writings and their pictures to be kept in all the public libraries, among the ancient and celebrated authors.

EUPHRASIA, **EYE-BRIGHT**; a genus of plants belonging to the didynamia class; and in the natural method ranking under the 40th order, *Personateæ*. See **BOTANY Index**.

EUPHRATES, a river universally allowed to take its rise in Armenia Major; but in what particular spot, or in what direction it afterwards shapes its course, there is the greatest disagreement. Strabo says, that the Euphrates rises in Mount Abus, which he joins with, or accounts a part of, Mount Taurus; that its beginning is on the north side of Mount Taurus; and that running, first westward through Armenia, then striking off to the south, it forces its way through that mountain: and thus it rises in the south of Armenia, Mount Taurus being the boundary on that side; and runs through its south part, quite to Cappadocia, conterminal with Armenia Minor; or quite to this last, or to its south limit; to reach which, it must bend its west course a little north; because Taurus, from which it rose, lies lower, or more to the south, and almost parallel with Melitene: and that then it turns to the south, in order

Euphony
||
Euphiates.

Eupolis,
Evremond.

to break through Taurus, and escape to Syria, and then take a new bend to Babylonia. To this account of Strabo, Pliny runs quite counter; adducing eye-witnesses, who carry the Euphrates from north to south in a right line, till it meets Mount Taurus; placing the springs to the east, as Strabo does; whence, he says, it runs in a long course westward, before it bends south; and that it rises not from Mount Taurus, but far to the north of it; and he makes it run straight west from its rise, then turn south spontaneously, without any interposing obstacle, in a manner quite different from Strabo, Mela, and others, who make Taurus the cause of this turn. The Euphrates naturally divides into two channels, one through Babylon, and the other through Seleucia, besides the several artificial cuts made between it and the Tigris about Babylon: and these cuts or trenches are what the Psalmist calls the rivers of Babylon, on the willows of which the captives hung their harps. It is probable, that the Euphrates naturally poured into the sea at one particular mouth, before these cuts were made. A thing appearing so evident to the ancients, that Pliny has set down the distance between the mouths of the Euphrates and the Tigris; and he says, some made it 25, and others 7, miles; but that the Euphrates being for a long time back intercepted in its course by cuts, made for watering the fields, only the branch called the *Pasitigris* fell into the sea, the rest of it into the Tigris, and both together into the Persian gulf. Overflowing the country through which it runs, at stated times of the year, like the Nile, it renders it fertile.

EUPOLIS, an Athenian comic poet, flourished about the 85th Olympiad. He took the freedom of the ancient comedy in lashing the vices of the people. He lost his life in a sea fight between the Athenians and Lacedaemonians; and his fate was so much lamented, that after his death it was enacted that no poet should serve in the wars. Some say Alcibiades put him to death for his satirical freedom.

EVREMOND, CHARLES DE ST DENIS, a polite scholar and soldier, was born at St Denis le Guast in Lower Normandy in 1613. He was intended for the profession of the law, and entered on the study; but he soon quitted it, and was made an ensign before he was 16. A military life did not hinder him from cultivating polite literature; and he signalized himself by his politeness and wit as much as by his bravery. The king made him a marshal de camp, and gave him a pension of 3000 livres per annum. He served under the duke of Candale in the war of Guienne; and in Flanders, till the suspension of arms was agreed on between France and Spain: he afterwards accompanied Cardinal Mazarine when he went to conclude the peace with Don Lewis de Haro, the king of Spain's first minister. He wrote, as he had promised, a long letter to the marquis de Crequi, of this negotiation; in which he showed, that the cardinal had sacrificed the honour of France to his own private interest, and rallied him in a very satirical manner. This letter falling into the hands of the cardinal's creatures some time after his death, was represented as a state crime, and he was obliged to fly to Holland. He had too many friends in England (whither he had taken a tour the year before with the count de Soissons, sent to compliment Charles II. upon his restoration) to make any

long stay in Holland; and therefore passed over into England, where he was received with great respect, and admitted into intimate friendship with several persons of distinction. The king gave him a pension of 300l. a-year. He had a great desire to return to his native country; and, after the peace of Nimeguen, wrote a letter in verse to the king of France to ask leave, but in vain. Upon the death of King Charles, he lost his pension. He did not rely much on King James, though that prince had shown himself extremely kind to him. The Revolution was advantageous to him. King William, who had known him in Holland, gave him substantial marks of his favour. He died of a strangury in 1703, aged 90; and was interred in Westminster abbey, where a monument is erected to his memory. His behaviour was engaging, his humour cheerful, and he had a strong disposition to satire: he professed the Roman religion, in which he was born; but at the bottom was certainly a freethinker. He always spoke of his disgrace with the resolution of a gentleman; and whatever strong desire he had to return to his country, he never solicited the favour with meanness: therefore, when this leave was signified to him unexpectedly in the decline of his life, he replied, that the infirmities of age did not permit him to leave a country where he lived agreeably. There have been many editions of his works: but the best is that of Amsterdam in 1726, in 5 vols. 12mo, to which is prefixed his life by Doctor Des Maizeaux; who has also given an accurate English translation of them in 3 vols. 8vo.

EURIPIDES, one of the Greek poets who excelled in tragedy, was born about 468 B. C. in the isle of Salamis, whither his father and mother had retired a little before Xerxes entered Attica. He learnt rhetoric under Prodicus, morality under Socrates, and natural philosophy under Anaxagoras; but at 18 years of age abandoned philosophy, in order to apply himself to dramatic poetry. He used to shut himself up in a cave to compose his tragedies, which were extremely applauded by the Greeks. The Athenian army, commanded by Nicias, being defeated in Sicily, the soldiers purchased their lives and liberties by reciting the verses of Euripides; such esteem and veneration had the Sicilians for the pieces wrote by this excellent poet. Socrates, the wisest of the philosophers, set such a value upon them, that they were the only tragedies he went to see acted; and yet his performances seldom gained the prize. Euripides frequently intersperses through them moral sentences, and severe reflections on the fair sex; whence he was called the *Woman-hater*. He was, nevertheless, married: but the scandalous lives of his two wives drew upon him the raillery of Aristophanes, and other comic poets; which occasioned his retiring to the court of Archelaus, king of Macedon, where he was well received. That prince was fond of learned men, and drew them to him by his liberality. If we may believe Solinus, he made Euripides his minister of state, and gave him other extraordinary proofs of his esteem. He had, however, passed but a few years there, when an unhappy accident put an end to his life. He was walking in a wood, and, according to his usual manner, in deep meditation; when, unfortunately happening upon Archelaus's hounds, he was by them torn in pieces. It is not certain whether

Evremond,
Euripides.

Euripus,
Euro-lydon

ther his death happened by chance, or through envy of some of the great courtiers. However, Archelaus buried him with great magnificence; and the Athenians were so much afflicted at his death, that the whole city went into mourning. Of 92 tragedies which he composed, only 19 are remaining: the most valuable editions of which are those of Aldus, in 1503, 8vo; of Plantin, in 1570, sexefimo; of Comelin, in 1597, 8vo; of Paul Stevens, in 1604, 4to; and of Joshua Barnes, 1694, folio.

EURIPUS, a canal or strait which divides the island of Eubœa, now Negropont, from the continent of Greece. In one place it is so narrow, that a galley can scarcely pass through it. The agitations of the Euripus were much spoken of by the ancients. Some say that the canal has a flux and reflux six times in 24 hours; others, that it ebbs and flows seven times a day; but Livy does not allow this flux and reflux to be so regular. Father Babin, a Jesuit of great learning, who made many observations on the spot during his long abode in the island of Negropont, tells us, that the Euripus is regular in its ebbing and flowing the first eight days of the moon: the same regularity he observed from the 14th to the 20th day inclusive, and in the three last days: but in the other days of the lunar month, it is not so regular; for it sometimes ebbs and flows 11, 12, 13, and 14 times in the space of a natural day. In this place, as the story commonly goes, Aristotle drowned himself out of chagrin, for not being able to account for so unusual a motion.

EURIPUS has since become a general name for all straits, where the water is in great motion and agitation.

The ancient circuses had their euripi, which were no other than pits or ditches on each side of the course, into which it was very dangerous falling with their horses and chariots as they ran races. The term *euripus* was more particularly applied by the Romans to three canals or ditches which encompassed the circus on three sides, and which were filled occasionally to represent *naumachia* or sea battles. The same people called their smaller fountains or canals in their gardens *euripuses*; and their largest, as cascades, &c. *niles*.

EUROCLYDON, (of *Ευρος*, *east wind*, and *κλυδων*, *wave*,) is a species of wind, of which we have an account only in Acts xxvii. 14. and concerning the nature of which critics have been much divided. Bochart, Grotius, Bentley, and others, substitute another reading, supported by the Alexandrian MS. and the Vulgate, viz. *Ευρακλων*, or *Euro-aquilo*; but Mr Bryant defends the common reading, and considers the *Euroclydon*, i. e. *Ευρος κλυδων*, as an east wind that causes a deep sea or vast inundation. He maintains, in opposition to Dr Bentley's reasoning, who supposes that the mariners in the ship, the voyage of which is recited in this passage, were Romans, that they were Greeks of Alexandria, and that the ship was an Alexandrian ship employed in the traffic of carrying corn to Italy; and therefore, that the mariners had a name in their own language for the particular typhonic or stormy wind here mentioned. He always shows from the passage itself, that the tempestuous wind called *Euroclydon*, beat (*κατ' αυτης*) upon the island of Crete; and therefore, as this is a relative expression, referring to the situation of the person who speaks of it, who was at that time to the

windward or south of it, the wind blew upon shore, and must have come from the south or south-east; which, he adds, is fully warranted by the point where the ship was, and the direction it ran in afterwards, which was towards the north and north-west.

EUROPA, in fabulous history, a daughter of Agenor king of Phœnicia and Telephassa. She was so beautiful that Jupiter became enamoured of her; and the better to seduce her, he assumed the shape of a bull and mingled with the herds of Agenor, while Europa, with her female attendants, [were gathering flowers in the meadows. Europa caressed the beautiful animal; and at last had the courage to sit upon his back. The god took advantage of her situation; and with precipitate steps retired towards the shore, crossed the sea with Europa on his back, and arrived safe in Crete. Here he assumed his original shape and declared his love. The nymph consented, though she had once made vows of perpetual celibacy; and she became mother of Minos, Sarpedon, and Rhadamanthus. After this distinguished amour with Jupiter, she married Asterius king of Crete. This monarch seeing himself without children by Europa, adopted the fruit of her amours with Jupiter, and always esteemed Minos, Sarpedon, and Rhadamanthus, as his own children. Some suppose, that Europa lived about 1552 years before the Christian era.

EUROPE, one of the four quarters of the world. This is considerably the smallest of the four grand divisions of the terraqueous globe. Its length, from east to west, according to the most authentic accounts, measures about 3300 miles British measure, and its breadth 2350. The continental part of it is bounded on the south by the Mediterranean sea, on the west by the Atlantic ocean, comprehending the most distant isle of Europe, viz. that of Iceland, for Greenland is now considered as constituting a part of North America. Many geographers of eminence have given the Azores to Europe, from their greater proximity to Portugal than to any other continental country, and have considered the Madeiras as a constituent part of Africa for a similar reason. Europe is bounded on the north by the Arctic ocean and the new land; while its eastern limits appear to be more uncertain in the estimation of geographers. It appears evident, however, that a very natural limit might be ascertained by tracing the river Oufa from its source to its confluence with the Belaia; and thence from the Kama to the Volga, which would make its division extremely natural to the town of Sarepta; it requiring only an imaginary line of very small extent from that place to the river Don, which would satisfactorily ascertain its western boundary.

The western and southern parts of Europe anciently consisted of the people called *Celts*; the Fins occupied the north-east, and the Laplanders, a people equally diminutive with the Samoeds of Asia, possessed its remotest parts towards the north, who rendered their own language less uncouth and barbarous by assimilating it to that of the Fins. The Goths from Asia seem to have driven those ancient inhabitants towards the east and north, whose descendants occupy the greater part of Europe. From the Slavonic tribes, who also came from Asia, the Poles, Russians, &c. were descended. These were accompanied by the Heruli, who made use of what is now denominated the Lettic speech, to be-

Europa,
Europe.

Europe. met with in Courland, Livonia, Lithuania, Prussia, and Samogitia, and nearly allied to the Slavonic language, according to the account of Tooke in his view of Russia. At an early period the colony of Iberi and northern Mauritanii, came over into Spain; and at a later period both the Hungarians and Turks emigrated from Asia.

Notwithstanding the high character of d'Anville as a geographer, we believe that his opinion respecting the geographical knowledge of the ancients is greatly exaggerated. It appears evident that nothing more of Scandinavia was known to the ancients than the southern part as far as the lakes of Weter and Wener. It is no doubt true that the Romans, by means of their shipping, even in the imperfect state of navigation at that period, traversed the southern shores of the Baltic, as far as to the river Kubo, ascertaining the names of various tribes along that coast; but if the maps of Ptolemy are admitted as decisive proofs in this case, it is certain that they were wholly unacquainted with the interior of Germany; and consequently the tribes of which he makes mention, may rather be considered as having dwelt along the northern shores of the Baltic, or the southern parts on the left of the Danube. They were no doubt acquainted with the Carpathian mountains; but their knowledge of Europe towards the north-east was undoubtedly circumscribed by the 50th or 52d degree of north latitude.

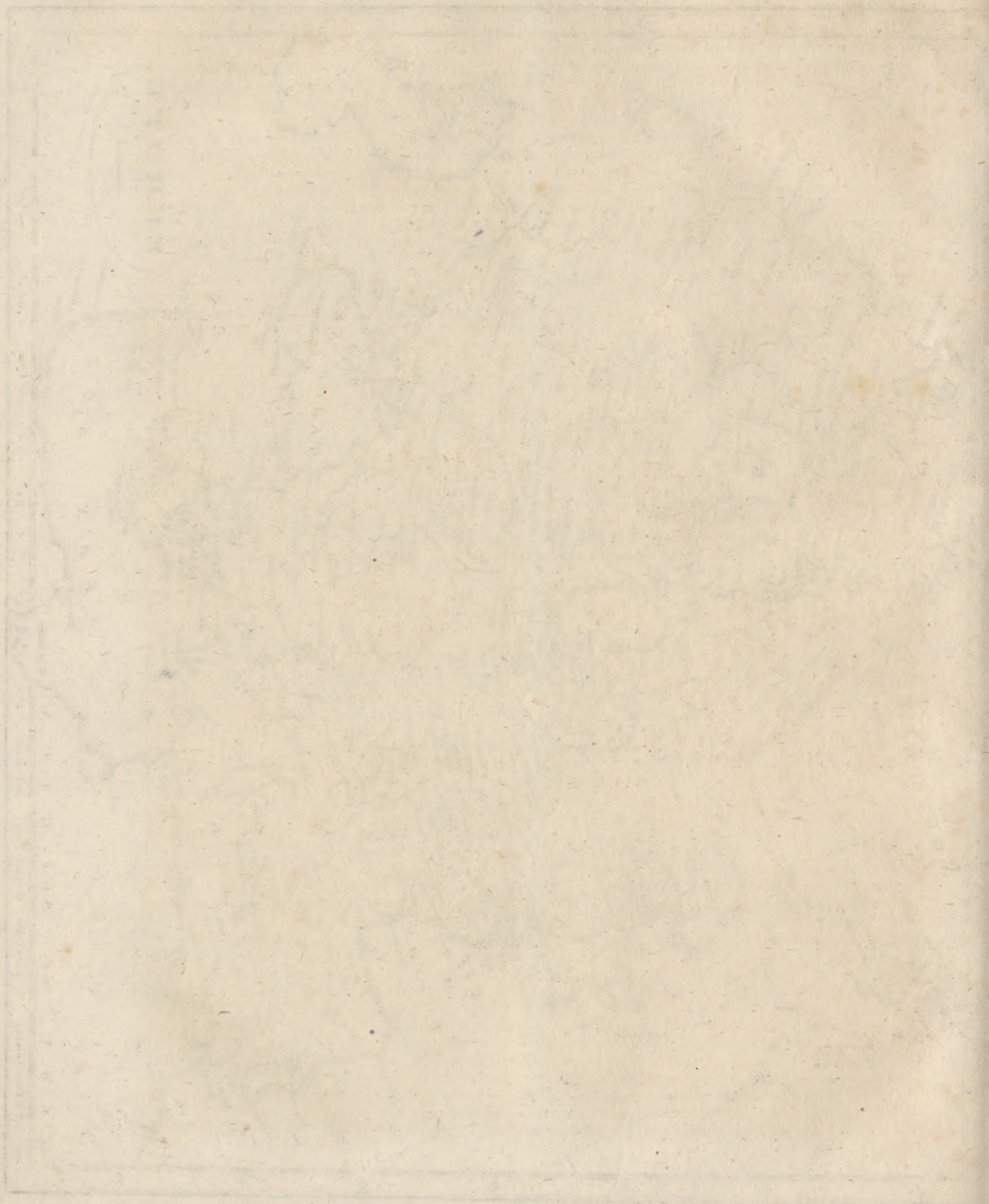
In many barbarous languages, the same word was often used indiscriminately either for a mountain or a forest, the want of attention to which has frequently been the prolific source of error, and placed mountains of the greatest consequence where the hand of nature had planted trees. It has been supposed that the Riphæan mountains were the Uralian chain, of which the ancients knew nothing, instead of a forest of prodigious extent from east to west. It is also well known that the *Venedici Montes* of Ptolemy have no existence upon earth, and therefore must once have been a very extensive forest with which the moderns are unacquainted, and perhaps no traces of it are now anywhere to be met with.

Christianity is the predominant religion all over Europe, except in Turkey; and even there it has been computed, that about one-half of the inhabitants are members of the Greek church. The Christian religion has always been accompanied in its progress with the diffusion of knowledge, the extension of industry, and the civilization of manners, whereas the barbarous tribes in the northern parts of Europe advanced by very slow degrees, and the Scandinavians continued in a state of pagan ignorance till the eleventh century. Some tribes of Slavonia to the south of the Baltic, were not converted to Christianity till the thirteenth century, and of course were for many ages in a state little superior to brutality; and the people of Lapland were not converted to the Christian faith till about a century ago, by means of missionaries sent from Denmark. The people of Europe, as to matters of religion, are divided into catholics and protestants, the former being chiefly confined to the southern parts of it, where the imagination requires the gratifications arising from external pomp and parade; and the latter in the northern parts of it, the simplicity of which is much better calculated to please the predominant exercise of the judgment. The

Christian religion being thus diffused all over Europe, that division of the globe has hence become a kind of republic in respect of literature, every scientific invention and discovery being transmitted from one portion of it to another with the utmost dispatch. For this reason Europe has been sometimes compared to ancient Greece, and it is to be hoped that Russia will never prove another Macedon.

The greater part of this quarter of the globe lies within the northern temperate zone, a distinction which is now nearly annihilated by the interesting discoveries of modern geography. Climate is found to depend very frequently on causes which are purely local, since the Alps in a southern latitude, exhibit mountains of ice which are not known even in Lapland, while the torrid zone is plentifully supplied with water and habitations, and for any thing which can be determined to the contrary, it may contain mountains which are covered with snow. As it is happily delivered from those intense heats which are peculiar to Asia and Africa, the inhabitants are in general blessed with greater bodily vigour and intellectual strength.

One of the most striking features of Europe in a general point of view is its inland seas, which give it a decided superiority over the other more extensive divisions of the earth, and contribute powerfully to the extension of its industry, commerce, and civilization. If such blessings had been enjoyed by Africa, it is more than probable that the consequences of her industry would have been diffused far and wide. Of these inland seas, the Mediterranean holds the most distinguished place, as the centre of civilization both to the ancient and modern inhabitants of Europe. It is about 2000 miles in length to its farthest extremity in Syria, but the maps of antiquity made it 500 more. The gulfs of Venice and the Archipelago open on its northern side, formerly denominated the Adriatic and Egean seas, from the last of which there is a communication with the sea of Marmora, or the Propontis, by means of the Hellespont; and the strait of Constantinople leads into the Black sea, to the north of which is the sea of Azof, (*Palus Mæotis*), or utmost maritime boundary of Europe in that direction. This vast expanse of water is beautifully ornamented with numerous islands and an opulent sea coast, exhibiting delightful specimens of almost every thing in nature which is sublime and beautiful. Tides cannot be perceived except in straits of very small dimensions, although naturalists have observed, that a current sets along the shores of Italy from west to east, while its direction is from east to west towards the coast of Africa. In the gulf of Venice the current runs along Dalmatia in a north-west direction, and returns by the opposite shore of Italy. There is abundance of fish to be met with in the Mediterranean, some of which are but rarely to be found in more northern latitudes. This sea in particular abounds with coral, now certainly known to be the production of marine insects. This imaginary plant is tri-coloured, composed of red, vermilion and white, and does not exceed eleven inches in height. It is hard in the sea, and in this respect undergoes not the smallest change by exposure to the air; and the nets made use of for procuring it, measure from 60 to 125 feet. From the colour of its rocks or perilous navigation, the Black sea is said to have derived its name. As the sea of Azof



Europe. Azof almost always exhibits a muddy appearance, it was for that reason denominated *Palus* by the ancients, and it is united to the Euxine or Black sea by the strait of Caffa.

The next inland sea of Europe is the Baltic, to which the Germans have given the name of the Eastern sea, which accounts for the people denominated *Easterlings* in the history of England, who undoubtedly came from the shores of the Baltic. It opens from the German sea by a gulf trending north-east, known by the name of the *Skager Rack*, from whence it passes southward in the *Cattegat*, to the south-east of which we meet with the sound of *Ellsnore*, where vessels become in some degree tributary to the king of Denmark. It is afterwards divided into two branches of great extent, called the gulfs of *Bothnia* and *Finland*, both of which are covered with ice for nearly five months in the year. The greatest depth of the Baltic is said not to exceed 50 fathoms; and according to the opinion of naturalists, its extent suffers a diminution of four feet every century. It has been affirmed that its waters do not contain above one-thirtieth of salt, while other sea-waters frequently contain one-tenth, which has been ascribed to the vast quantity of ice; and when the north wind blows, these waters, it is also said, may be employed for the purposes of domestic economy. There are no tides in the Baltic, and but very few fish.

The White sea, in the northern parts of Russia, is the last inland sea of Europe, which was well known to the English in particular, before the commerce of Archangel was transferred to Peterburgh. It went by the name of *Queen sea* in the reign of Alfred the Great; and the writers of Iceland called it the sea of *Ganviick*, on the shores of which stood their *Biarmia*. There are a number of islands in the White sea, but the accounts which geographers have hitherto given us, are neither circumstantial nor satisfactory.

The German sea deserves to be mentioned among the other maritime divisions of Europe, which has received this appellation because it waters the western shores of ancient Germany, from the Rhine to the farthest boundary of *Jutland*. It may properly be regarded as constituting a part of the Atlantic ocean, ending at the straits of *Dover*, from whence the British channel extends to the west. Another extensive inlet of the Atlantic is the bay of *Biscay*; for the British channel is rather to be considered as the wide frith of the *Seyvern*. *St George's* channel lies on the south between Great Britain and Ireland, and the Irish sea leading to the North channel, is situated in the centre. What the ancients called the *Deucalionian sea*, lies to the north of Scotland, which was likewise denominated the *Sarmatian*, as extending throughout the Baltic.

The Arctic ocean lies to the north of Europe, the dismal receptacle of countless miles of ice, piled up in mountains, the hoary majesty of which, while it captivates the eye, can scarcely fail to strike terror into the heart of the mariner. Yet from those dreary regions, which at first appear only as a prodigious waste in the works of creation, the benevolent Parent of the universe diffuses innumerable millions of herrings for the use of man. This is worthy of the divine being whose goodness is whispered to us in every breeze, which glows in the starry firmament of heaven, and is diffused through the whole creation.

The Goodwin sands in the vicinity of the Kentish coast, are as dangerous to the mariner as uninviting to the fisher; but excellent fish are to be found on many banks on the coast of Holland, among which may be ranked the cod, the soal, and the plaice. What are called the silverpits of the mariners, lying between the *Dogger* and *Well bank*, supply the London market with cod, which discovers a predilection for the deep waters in the vicinity of the banks. The *Hornriff*, a narrow strip extending to *Jutland*, is situated towards the north east of the *Dogger bank*. The *Juttriff* extends from the mouth of the Baltic to the German sea, in the form of a crescent.

The *Mar bank* takes its rise opposite to *Berwick*, which is little more than 15 miles in length. To the eastward of this lies the *Long Forties*, extending from *Buchannels* to *Newcastle*, and from between 40 and 100 miles from the shore; and a bank reaches across the German sea towards *Juttriff*, from the coast of *Buchan*. It was thought necessary, in this concise account of Europe, to mention some of the most considerable banks or comparative shoals, which have often been regarded as the summits of lofty mountains beneath the surface of the deep; and which, as the haunts of fishes of different species, have arrested the attention of national industry.

A description of the principal rivers of Europe will be given in our account of the countries through which they respectively flow. The greater part of the *Wolga* is considered as belonging to Europe; the next highly celebrated river is the *Danube*, after which we may rank the *Nieper*, the *Rhine*, and the *Elbe*. The *Alps* are the loftiest mountains; next the *Pyrenees*; and that vast ridge by which *Norway* is divided from *Sweden*. The *Carpathian mountains*, the chain called *Emineh*, and the *Apennines*, are of inferior magnitude.

The European states and kingdoms may properly be divided into three classes; 1. Despotic monarchies, of which *Russia* and *Turkey* may serve as specimens. 2. Absolute monarchies, such as *Spain* and *Denmark*. And 3. Those of a limited nature, as the Germanic empire, and the kingdom of *Great Britain*. Since the governments of *Venice*, *Switzerland* and *Holland* were subverted by the *French*, few, if any traces of a permanent aristocracy are to be met with, or any government in the hands of hereditary nobility. In some of the *Swiss cantons* we may perhaps find the shadow of democracy; and *France* is at present a military despotism called an empire, the right of succession being hereditary indefeasible.

It is customary with some geographers to divide the constituent parts of Europe into first, second, and third orders, according to their political importance; the first order including the united kingdoms of *Great Britain* and *Ireland*, *France*, *Russia*, the *Austrian dominions*, *Prussia*, *Spain*, *Turkey*. In the second order stand the *United Provinces*, *Denmark*, *Sweden*, *Portugal* and *Switzerland*; and the chief states of *Germany* and *Italy* constitute the third, a detailed account of which our readers will find in this work under their proper names.

EURYALE, in *Mythology*, one of the Gorgons, daughter of *Phorcys*, and sister of *Medusa*; she was subject neither to old age nor death.

EURYANDRA, a genus of plants belonging to the polyandria class. See *BOTANY Index*.

EURYDICE.

Europe
||
Euryandra.

Eurydice
||
Eusebians.

EURYDICE, in fabulous history, the wife of Orpheus, who, flying from Aristæus that endeavoured to ravish her, was slain by a serpent. Her husband went down to the shades, and by the force of his music persuaded Pluto and Proserpine to give him leave to carry back his wife; which they granted, provided he did not look on her till he came to the light: but he breaking the condition, was forced to leave her behind him. See **ORPHEUS**.

EURYMEDON, in *Ancient Geography*, a noble river running through the middle of Pamphylia; famous for a sea and land fight on the same day, in which the Athenians under Cimon the son of Miltiades, defeated the Persians. The sea fight happened first in the sea of Pamphylia, towards Cyprus; the land engagement, the following night on the Eurymedon. Cimon, after defeating the Persian fleet, armed his men with the armour of the captives, and set sail for the enemy, who lay on the banks of the Eurymedon, in the ships taken from the Persians; who on seeing their own ships and their own people in appearance, were off their guard, and thus became an easy conquest.

EURYSTHEUS, a king of Argos and Mycenæ, son of Sthenelus and Nicippe the daughter of Pelops. Juno hastened his birth by two months, that he might come into the world before Hercules the son of Alcmena, as the younger of the two was doomed by order of Jupiter to be subservient to the will of the other. (See **ALCMENA**.) This natural right was cruelly exercised by Eurystheus, who was jealous of the fame of Hercules; and who to destroy so powerful a relation, imposed upon him the most dangerous and uncommon enterprises, well known by the name of the *twelve labours of Hercules*. The success of Hercules in achieving those perilous labours alarmed Eurystheus in a greater degree, and he furnished himself with a brazen vessel, where he might secure himself a safe retreat in case of danger. After the death of Hercules, Eurystheus renewed his cruelties against his children, and made war against Ceyx king of Trachinia, because he had given them support, and treated them with hospitality. He was killed in the prosecution of this war by Hyllus the son of Hercules. His head was sent to Alcmena the mother of Hercules; who, mindful of the cruelties which her son had suffered, insulted it, and tore out the eyes with the most inveterate fury. Eurystheus was succeeded on the throne of Argos by Atreus his nephew. The death of Eurystheus happened about 30 years before the Trojan war.

EURYTHMY, in *Architecture, Painting, and Sculpture*, is a certain majesty, elegance, and easiness, appearing in the composition of divers members or parts of a body, painting, or sculpture, and resulting from the fine proportion of it.

EUSDEN, **LAURENCE**, an Irish clergyman, rector of Conesby in Lincolnshire, and poet laureat after the death of Mr Rowe. His first patron was the eminent Lord Halifax; whose poem, on the battle of the Boyne, he translated into Latin, and dedicated to his lordship. He was esteemed by the duke of Newcastle, who rewarded an epithalamium he wrote on his marriage with the place of poet laureat. He was the author of many poetical pieces, though but little known before his preferment: he died in 1730.

EUSEBIANS, a denomination given to the sect of

Arians, on account of the favour and countenance which Eusebius, bishop of Cæsarea, showed and procured for them at their first rise. See **ARIANS** and **EUSEBIUS**.

EUSEBIUS, surnamed **PAMPHILUS**, a celebrated bishop of Cæsarea in Palestine, and one of the most learned men of his time, was born in Palestine about the latter end of the reign of Gallienus. He was the intimate friend of Pamphilus the Martyr; and, after his death, took his name in honour to his memory. He was ordained bishop of Cæsarea in 313. He had a considerable share in the contest relating to Arius; whose cause he, as well as several other bishops of Palestine, defended, being persuaded that Arius had been unjustly persecuted by Alexander bishop of Alexandria. He assisted at the council of Nice in 325; when he made a speech to the emperor Constantine on his coming to the council, and was placed next him on his right hand. He was present at the council of Antioch, in which Eustathius bishop of that city was deposed; but though he was chosen by the bishop and people of Antioch to succeed him, he absolutely refused it. In 335, he assisted at the council of Tyre held against Athanasius; and at the assembly of bishops at Jerusalem, at the time of the dedication of the church there. By these bishops he was sent to the emperor Constantine to defend what they had done against Athanasius; when he pronounced the panegyric made on that emperor during the public rejoicings in the beginning of the 30th year of his reign, which was the last of his life. Eusebius survived the emperor but a short time, for he died in 338. He wrote. 1. An Ecclesiastical History, of which Valetius has given a good edition in Greek and Latin; 2. The life of Constantine; 3. A treatise against Hierocles; 4. *Chronicon*; 5. *Preparations Evangelicæ*; 6. *De demonstratione Evangelica*, of which there are but 10 books extant out of 20; and several other works, some of which are lost.

EUSTACHIUS, **BARTHOLOMEW**, physician and anatomist at Rome, flourished about the year 1550. His anatomical plates were discovered there in 1712, and published in 1714.

EUSTATHIANS, a name given to the Catholics of Antioch in the 4th century, on occasion of their refusal to acknowledge any other bishop beside St Eustathius, deposed by the Arians.

The denomination was given them during the episcopate of Paulinus, whom the Arians substituted to St Eustathius, about the year 330, when they began to hold their assemblies apart. About the year 350, Leontius of Phrygia, called the *eunuch*, who was an Arian, and was put in the see of Antioch, desired the Eustathians to perform their service in his church; which they accepting, the church of Antioch served indifferently both the Arians and Catholics.

This, we are told, gave occasion to two institutions, which have subsisted in the church ever since. The first was psalmody in two choirs; though M. Baillet thinks, that if they instituted an alternate psalmody between two choirs, it was between two Catholic choirs, and not by way of response to an Arian choir. The second was the doxology, *Glory be to the Father, and the Son, and the Holy Ghost*. See **DOXOLOGY**.

This conduct, which seemed to imply a kind of communion with the Arians, gave great offence to abundance

Eusebius
||
Eustathians

Eustathians dance of Catholics, who began to hold separate meetings; and this formed the schism of Antioch. Upon this, the rest, who continued to meet in the church, ceased to be called *Eustathians*, and that appellation became restrained to the dissenting party. St Flavianus, bishop of Antioch in 381, and one of his successors, Alexander, in 482, brought to pass a coalition, or reunion, between the *Eustathians* and the body of the church of Antioch, described with much solemnity by Theodoret, *Ecccl.* lib. iii. c. 2.

EUSTATHIANS were also a sect of heretics in the fourth century, denominated from their founder Eustathius, a monk so foolishly fond of his own profession, that he condemned all other conditions of life. Whether this Eustathius was the same with the bishop of Sebastia and chief of the Semi-Arians, is not easy to determine.

He excluded married people from salvation; prohibited his followers from praying in their houses; and obliged them to quit all they had, as incompatible with the hopes of heaven. He drew them out of the other assemblies of Christians to hold secret ones with him, and made them wear a particular habit: he appointed them to fast on Sundays; and taught them, that the ordinary fasts of the church were needless, after they had attained to a certain degree of purity which he pretended to. He showed great horror for chapels built in honour of martyrs, and the assemblies held therein. Several women seduced by his reasons, forsook their husbands, and abundance of slaves deserted their masters houses. He was condemned at the council of Gangra in Paphlagonia, held between the years 326 and 341.

EUSTATHIUS, bishop of Thessalonica, in the 12th century, under the reigns of the emperors Emanuel, Alexander, and Andronicus Comnenus. He was a very eminent grammarian; and wrote commentaries upon Homer, and Dionysius the geographer. The best edition of his Commentaries on Homer is that of Rome, printed in Greek, in 1542, in four volumes folio. His Commentaries on the Periegesis of Dionysius were printed by Mr Hudson at Oxford, in 1697, 8vo. Eustathius appears to have been alive in the year 1194.

EUSTATIA, *ST EUSTATIA*, or *Eustatius*, one of the Caribbee islands, belonging to the Dutch, and situated in W. Long. 62. 56. N. Lat. 17. 29. It is little else than a huge mountain, which formerly has, in all probability, been a volcano. Its situation is so strong, that it has but one landing place; and that is fortified in such a manner as to be almost impregnable. Tobacco is the chief product of the island; and it is cultivated to the very top of the pyramid, which terminates in a large plain surrounded with woods, but having a hollow in the middle, which serves as a large den for wild beasts. No fewer than 5000 white people and 15,000 negroes subsist on this spot, where they rear hogs, kids, rabbits, and all kinds of poultry, in such abundance, that they can supply their neighbours, after having served themselves.

The first Dutch colony sent to this island consisted of about 1600 people. They were dispossessed by the English from Jamaica in 1665. Soon after, the Dutch and French becoming confederates, the English were expelled in their turn. The French continuing to hold

a garrison in the island till the treaty of Breda, when it was restored to the Dutch. Soon after the revolution, the French drove out the Dutch, and were in their turn driven out by the English under Sir Timothy Thornhill, with the loss of no more than eight men killed and wounded, though the fort they took mounted 16 guns, and was in every other respect very strong. Sir Timothy found it necessary for the protection of the Dutch, to leave a small English garrison in the fort; but he granted the French no terms of capitulation, except for their lives and baggage. By the peace of Ryfwick, the entire property of this island was restored to the Dutch.

This island was reduced by the British in the year 1781. Though not 20 miles in circumference, it abounded at that time with riches, by reason of the vast conflux of trade from every other island in these seas. Being a free port, it was open to all the subjects of the belligerent powers; and thus a communication was established among them, through which they were enabled to carry on a commercial correspondence, which greatly mitigated the inconveniences of war. The greatest benefit, however, was reaped by the Dutch; who, by transacting all trading business for other nations, were thus intrusted with numberless commissions, and likewise enjoyed vast profits from the sale of the merchandises to which they were entitled. At the time the attack was made upon them, they were so little under the apprehensions of such an event, that their warehouses were not sufficient to contain the quantity of commercial articles imported for sale, and the beach and streets were covered with hogsheds of tobacco and sugar. In this situation, Admiral Rodney having received orders to commence hostilities against the Dutch, suddenly appeared before the island with such an armament of sea and land forces, as in its defenceless situation was not only useless but ridiculous. The governor could scarcely credit the officer who summoned him to surrender; but being convinced how matters stood, the only possible step was taken, namely, to surrender the whole island, and every thing in it, at discretion. Along with the island there fell into the hands of the captors a ship of 60 guns, with 250 sail of merchantmen, while the value of property on the island was estimated at no less than four millions sterling. This capture became afterwards a subject of discussion in parliament, where the conduct of the British commanders was severely scrutinized by Mr Burke. The admiral and general made their defence in person: but the minority at that time were far from being satisfied; and it was supposed that on the change of ministry a rigid inquiry would have been set on foot, had not the splendour of Admiral Rodney's victory over de Grasse put an end to all thoughts of that nature.

The island of St Eustatius is naturally of such difficult access, as already observed, that it is almost impossible for an enemy to effect a landing if proper care is taken by those who are in possession of it. This very circumstance proved the ruin of the new possessors. The British, secure in their inaccessible situation, conducted themselves in such a manner as induced the Marquis de Bouille to make an attempt to regain it. Having sailed from Martinico at the head of 2000 men, he arrived on the 26th of November 1781, off one of the landing

Eustatia
||
Eutropius.

places of the island, which was deemed so inaccessible that it had been left without a guard. With much loss and difficulty, however, he landed here with four or five hundred of his people during the night. The appearance of day put an end to his landing any more; and he now saw himself obliged either to relinquish the enterprise or to attack the garrison, which was almost double the number of those he had on the island. He chose the latter: and was favoured in his enterprise by the extreme negligence of his antagonists. A difficult pass, which a few men might have occupied with success against a great number, was left unguarded, which the marquis secured in time, and then pushed forward with the utmost expedition. The British, mistaking a body of Irish troops which attended the French commander for their own comrades, suffered them to approach without thinking of opposing them. They were then exercising on the parade; but were soon made sensible of their fatal mistake by a close discharge from their supposed friends, by which many were killed and wounded. The surprise occasioned by this sudden attack was so great, that no resistance could be made; especially as their commanding officer, Colonel Cockburn, who happened at that instant to come upon the parade, was made prisoner. A number of them, however, hastened to the fort with a view of making head against the enemy; but the French had already taken possession of the gate, and prevented the drawbridge from being raised. They entered the fort; which, being surrendered by those who had taken shelter in it, the rest of the garrison, dispersed in various places, and imagining the number of the enemy to be much greater than it really was, submitted without any opposition. The French commander took this opportunity of showing his disinterestedness in pecuniary matters. Among the spoils that fell into his hands a large sum of money was claimed by the British commanding officer as being his private property, which was generously restored to him: in like manner the property of the Dutch inhabitants was reserved to them, and nothing was allowed to be seized but the produce arising from the sale of prizes that had been taken by the English when they captured the island.

EUSTYLE, in *Architecture*, a sort of building in which the pillars are placed at the most convenient distance one from another, the intercolumniations being just two diameters and a quarter of the column, except those in the middle of the face, before and behind, which are three diameters distant.

EUTERPE, one of the Muses, daughter of Jupiter and Mnemosyne. She presided over music, and was looked upon as the inventress of the flute. She is represented as crowned with flowers and holding a flute in her hands: Some mythologists attributed to her the invention of tragedy, more commonly supposed to be the production of Melpomene.

EUTHYMIA, among the Greeks, signified such a disposition or state of the mind, as could not be ruffled either by good or bad fortune, by sickness or health, good or evil.

EUTROPIUS, FLAVIUS, a Latin author, in the 4th century, was secretary to Constantine the Great, and afterwards bore arms under the emperor Julian, and followed that prince in his expedition against the Persians. He wrote an Abridgement of the Roman

History, from the foundation of Rome to the reign ^{Eutychians.} of Valens; the best edition of which is that of Miss Le Fevre, afterwards Madame Dacier, published at Paris for the use of the Dauphin, in 4to, in the year 1683.

EUTYCHIANS, ancient heretics, who denied the duplicity of natures in Christ; thus denominated from Eutyches, the archimandrite, or abbot of a monastery at Constantinople, who began to propagate his opinion A. D. 448. He did not, however, seem quite steady and consistent in his sentiments: for he appeared to allow of two natures, even before the union; which was apparently a consequence he drew from the principles of the Platonic philosophy, which supposes a pre-existence of souls: accordingly, he believed that the soul of Jesus Christ had been united to the divinity before the incarnation; but then he allowed no distinction of natures in Jesus Christ since his incarnation. This heresy was first condemned in a synod held at Constantinople by Flavian, in 448, approved by the council of Ephesus, called *conventus latronum*, in 449, and re-examined, and fulminated, in the general council of Chalcedon in 451. The legates of Pope Leo, who assisted at it, maintained, that it was not enough to define, that there were two natures in Jesus Christ; but insisted strenuously, that, to remove all equivocations, they must add these terms, without being changed, or confounded, or divided.

The heresy of the Eutychians, which made a very great progress throughout the east, at length became divided into several branches. Nicephorus makes mention of no fewer than twelve: some called *Schematici*, or *Apparentes*, as only attributing to Jesus Christ a phantom or appearance of flesh, and no real flesh: others, *Theodosians*, from Theodosius bishop of Alexandria: others, *Jacobites*, from one James (*Jacobus*), of Syria; which branch established itself principally in Armenia, where it still subsists. Others were called *Acephali*, q. d. without head; and *Severians*, from a monk called *Severus*, who seized on the see of Antioch in 513. These last were subdivided into five factions, viz. *Agnoetæ*, who attributed some ignorance to Jesus Christ; the followers of Paul; *Μελαινοί*, that is, the black *Angelites*, thus called from the place where they were assembled; and lastly, *Adrites* and *Conomites*.

EUTYCHIANS was also the name of another sect, half Arian half Eunomian; which arose at Constantinople in the fourth century.

It being then a matter of mighty controversy among the Eunomians at Constantinople, whether or not the Son of God knew the last day and hour of the world, particularly with regard to that passage in the gospel of St Matthew, chap. xxiv. ver. 36. or rather that in St Mark, xiii. 32. where it is expressed, that the Son did not know it, but the Father only; Eutychius made no scruple to maintain, even in writing, that the Son did not know it; which sentiment displeasing the leaders of the Eunomian party, he separated from them, and made a journey to Eunomius, who was then in exile. That heretic acquiesced fully in Eutychius's doctrine, and admitted him to his communion. Eunomius dying soon after, the chief of the Eunomians at Constantinople refused to admit Eutychius; who, upon this, formed a particular sect of such as adhered to him, called *Eutychians*.

This

Euty chius
||
Ex.

This same Euty chius, with one Theopronius, as was said in Sozomen's time, were the occasions of all the changes made by the Eunomians in the administration of baptism; which consisted, according to Nicephorus, in only using one immersion, and not doing it in the name of the Trinity, but in memory of the death of Jesus Christ. Nicephorus calls the chief of that sect, not *Euty chius*, but *Eupsy chius*, and his followers *Eunomiaupsy chiusians*.

EUTYCHIUS, patriarch of Alexandria, lived about the ninth age; and wrote annals in the Arabic language, printed at Oxford in 1658, with a Latin version by Mr Pococke. Selden had printed something of his before.

EUXINE or BLACK SEA, forms part of the boundary betwixt Europe and Asia. It receives the Nieper, the Danube, and other large rivers; and extends from 28 to 40 degrees of E. Long. and from 40 to 46 of N. Lat. The ancients imagined this sea to have been originally only a lake or standing pool which broke first into the Propontis, and then into the Egean, washing away by degrees the earth which first kept it within bounds, and formed the two channels of the Bosphorus Thracius and Hellepont, now the Dardanelles.—It was anciently called the *Axenus*, supposed to be from Athkenaz the son of Gomer, who is said to have settled near it. This original being forgot in length of time, the Greeks explained it by *inhospitable*, which the word *Axenos* literally signifies; and therefore, when they came to consider the inhabitants of these coasts as more civilized and hospitable, they changed the name into *Euxinus*, which it still retains.

EWE, the English name of a female sheep. See OVIS, MAMMALIA *Index*.

EWERY, in the British customs, an office in the king's household, to which belongs the care of the table-linen, of laying the cloth, and serving up water in silver ewers after dinner.

EX, a river that rises in a barren tract of land, called Exmore, in Somersetshire; and after being joined by several little streams, runs by Tiverton, where there is a stone bridge over the river. About nine miles below Tiverton, it is joined by a pretty large stream called the *Colombton*; and about two miles lower, by another stream formed by the junction of the Horton and Creden. With these additions, it washes the walls of Exeter. At Topsham, above four miles below Exeter, it receives another considerable addition to its stream; two miles farther, it is joined by the Ken; and falls into the ocean at Exmouth, after a course of about 40 miles. Ships of great burden go up to Topsham, from whence vessels of 150 tons are conveyed to the quay at Exeter, by means of an artificial canal. The Ex is navigable for vessels of considerable burden to Topsham. The passage, however, at the mouth of the river, is but narrow, having rocks on the east side and broad sands on the west; nor is the water on the bar more than six or seven feet deep at low water, but the tide rises 14 or 15 feet, so that it is deep enough at high water. When ships are within the bar they may ride afloat at a place called Starcross, about a mile and a half from the river's mouth; but those that go to Topsham lie aground on the ooze at low water.

EX OFFICIO, among lawyers, signifies the power

a person has, by virtue of his office, to do certain acts without being applied to. Thus a justice of peace may, *ex officio*, at his discretion, take surety of the peace, without complaint made by any person whatsoever.

Exacerba-
||
Exaltation.

There was formerly an oath *ex officio*, whereby a supposed offender was compelled in the ecclesiastical court to confess, accuse, or clear himself of a crime; but this law is repealed.

Ex Post Facto, in Law, something done after another: thus an estate granted may be good by matter *ex post facto*, that was not so at first, as in case of election.

EXACERBATION. See PAROKYSM.

EXACTION, in Law, a wrong done by an officer, or a person in pretended authority, in taking a reward or fee that is not allowed by law.

A person guilty of exaction may be fined and imprisoned. It is often confounded with EXTORTION.

EXACUM, a genus of plants belonging to the tetrandria class; and in the natural method ranking under the 20th order, *Rotaceæ*. See BOTANY *Index*.

EXÆRESIS, in Surgery, the operation of extracting or taking away something that is hurtful to the human body.

EXAGGERATION, in Rhetoric, a kind of hyperbole, whereby things are augmented or amplified by saying more than the truth, either as to good or bad.

EXAGGERATION, in Painting, a method by which the artist, in representing things, changes them too much, or makes them too strong, either in respect of the design or colouring. It differs from *caricaturing*, in that the latter perverts or gives a turn to the features of a face, &c. which they had not, whereas exaggeration only heightens or improves what they had.

EXALTATION, or ELEVATION, is chiefly used in a figurative sense, for the raising or advancing a person to some ecclesiastical dignity; and particularly to the papacy.

EXALTATION of the Cross is a feast of the Romish church, held on the 14th of September; in memory, as is generally supposed, of this, that the emperor Heraclius brought back the true cross of Jesus Christ on his shoulders, to the place on Mount Calvary from which it had been carried away 14 years before by Cosroes king of Persia, at his taking of Jerusalem, under the reign of the emperor Phocas. The cross was delivered up by a treaty of peace made with Siroe, Cosroes's son. The institution of this treaty is commonly said to have been signalized by a miracle; in that Heraclius could not stir out of Jerusalem with the cross while he had the imperial vestments on enriched with gold and precious stones, but bore it with ease in a common dress.

But long before the reign of Heraclius there had been a feast of the same denomination observed both in the Greek and Latin churches, on occasion of what our Saviour said in St John xii. 32. *And I, if I be exalted, or lifted up, will draw all men unto me.* And again, in chap. viii. ver. 28. *When you have exalted, or lifted up the Son of Man, then shall ye know that I am he.*

The feast of the dedication of the temple built by Constantine was held, says Nicephorus, on the 14th of

Exaltation September, the day on which the temple had been consecrated, in the year 335; and this feast was also called the *exaltation of the cross*, because it was a ceremony therein, for the bishop of Jerusalem to ascend a high place, built by Constantine for that purpose, in manner of a pulpit, called by the Greeks the *sacred mysteries of God*, or the *holiness of God*, and there hoist up the cross for all the people to see it.

||
Example.

EXALTATION, in *Physics*, denotes the act, or operation, of elevating, purifying, subtilizing, or perfecting any natural body, its principles and parts; also the quality or disposition which bodies acquire by such operation. The term *exaltation* has been peculiarly affected by the chemists and alchemists; who imagining it to have some extraordinary emphasis, are employing it on every occasion.

EXALTATION, in *Astrology*, is a dignity which a planet acquires in certain signs or parts of the zodiac; which dignity is supposed to give it an extraordinary virtue, efficacy, and influence. The opposite sign, or part of the zodiac, is called the dejection of the planet. Thus the 15th degree of Cancer is the exaltation of Jupiter, according to Albumazar, because it was the ascendant of that planet at the time of the creation; that of the sun is in the 19th degree of Aries, and its dejection in Libra; that of the moon is in Taurus, &c. Ptolemy gives the reason of this in his first book *De Quadrup.*

EXAMINATION, an exact and careful search or inquiry, in order to discover the truth or falsehood of a thing.

Self-EXAMINATION, is a point much insisted on by divines, and particularly the ancient fathers, by way of preparation to repentance. St Ignatius reduces it to five points; viz. 1. A returning thanks to God for his benefits. 2. A begging of grace and light, to know and distinguish our sins. 3. A running over all our actions, occupations, thoughts and words, in order to learn what has been offensive to God. 4. A begging of pardon, and conceiving a sincere sorrow for having displeased him. And, 5. Making a firm resolution not to offend him any more; and taking the necessary precautions to preserve ourselves from it.

EXAMINERS, in chancery, two officers of that court, who examine, upon oath, witnesses produced in causes depending there, by either the complainant or defendant, where the witnesses live in London or near it. Sometimes parties themselves, by particular order, are examined. In the country, above 20 miles from London, on the parties joining in commission, witnesses are examined by commissioners, being usually counsellors or attorneys not concerned in the cause.

EXAMPLE, in a general sense, denotes a copy or pattern.

EXAMPLE, in a moral sense, is either taken for a type, instance, or precedent, for our admonition, that we may be cautioned against the faults or crimes which others have committed, by the bad consequences which have ensued from them; or example is taken for a pattern for our imitation, or a model for us to copy after.

That examples have a peculiar power above the naked precept, to dispose us to the practice of virtue and holiness, may appear by considering, 1. That they most clearly express to us the nature of our duties in their

subjects and sensible effects. General precepts form abstract ideas of virtue; but in examples, virtues are most visible in all their circumstances. 2. Precepts instruct us in what things are our duty; but examples assure us that they are possible. When we see men like ourselves, who are united to frail flesh, and in the same condition with us, to command their passions, to overcome the most glorious and glittering temptations, we are encouraged in our spiritual warfare. 3. Examples, by secret and lively incentive, urge us to imitation. We are touched in another manner by the visible practice of good men, which reproaches our defects, and obliges us to the same zeal which laws, though wise and good, will not effect.

Example
||
Exarch.

The example of our Saviour is most proper to form us to holiness; it being absolutely perfect, and accommodated to our present state. There is no example of a mere man that is to be followed without limitation: But the example of Christ is absolutely perfect; his conversation was a living law: "He was holy, harmless, undefiled, and separate from sinners."

EXAMPLE, in *Rhetoric*, denotes an imperfect kind of induction or argumentation; whereby it is proved, that a thing which happened on some other occasion will happen again on the present one, from the similitude of the cases. As, "The war of the Thebans, against their neighbours the Phocians, was ruinous; consequently, that of the Athenians against their neighbours, will likewise be fatal."

EXANTHEMA, among *Physicians*, denotes any kind of efflorescence or eruption, as the measles, purple spots in the plague, or malignant fevers, &c.

EXARCH, in antiquity, an appellation given, by the emperors of the east, to certain officers sent into Italy, in quality of vicars, or rather prefects, to defend that part of Italy which was yet under their obedience, particularly the city of Ravenna, against the Lombards, who had made themselves masters of the greatest part of the rest.

The residence of the exarch was at Ravenna; which city, with that of Rome, was all that was left the emperors. The first exarch was the patrician Boetius, famous for his treatise, *De Consolatione Philosophiæ*; appointed in 568 by the younger Justin. The exarchs subsisted about 185 years, and ended in Eutychius: under whose exarchate the city of Ravenna was taken by the Lombard king Astolphus, or Astolphus.

The emperor Frederic created Heraclius, archbishop of Lyons, a descendant of the illustrious house of Montboissier, exarch of the whole kingdom of Burgundy; a dignity till that time unknown anywhere but in Italy, particularly in the city of Ravenna.

Homer, Philo, and other ancient authors, give likewise the name *exarchus* to the choragus or master of the fingers, in the ancient choruses, or him who sung first: the word αρχω or αρχουμι, signifying equally to *begin*, and to *commend*.

EXARCH of a Diocese was, anciently, the same with primate. This dignity was inferior to the patriarchal, yet greater than the metropolitan.

EXARCH also denotes an officer, still subsisting in the Greek church; being a kind of deputy or legate *à latere* of the patriarch, whose office it is to visit the provinces allotted him, in order to inform himself of the

the

Exarch ||
Exception. the lives and manners of the clergy; take cognizance of ecclesiastical causes; the manner of celebrating divine service; the administration of the sacraments, particularly confession; the observance of the canons; monastic discipline; affairs of marriages, divorces, &c. but above all, to take an account of the several revenues which the patriarch receives from several churches; and, particularly, as to what regards the collecting the same.

The exarch, after having greatly enriched himself in his post, frequently rises to the patriarchate itself.

EXARCH is also used, in the eastern church antiquity, for a general or superior over several monasteries; the same that we otherwise call archimandrite; being exempted, by the patriarch of Constantinople, from the jurisdiction of the bishops; as are now the generals of the Romish monastic orders.

EXAUCTORATIO, in the Roman military discipline, differed from the missio, which was a full discharge, and took place after they had served in the army 20 years; whereas the exauctoratio was only a partial discharge: they lost their pay indeed, but still kept under their colours or *vevilla*, though not under the *aquila* (or eagle), which was the standard of the legion: whence, instead of *Legionarii*, they were called *Subsignani*, and were retained till they had either served their full time or had lands assigned them. The exauctoratio took place after they had served 17 years.

EXCALCEATION, among the Hebrews, was a particular law, whereby a widow, whom her husband's brother refused to marry, had a right to summon him to a court of justice; and, upon his refusal, might excalceate him, that is, pull off one of his shoes, and spit in his face; both of them actions of great ignominy.

EXCELLENCY, a title anciently given to kings and emperors, but now to ambassadors, generals, and other persons who are not qualified for that of *highness*, and yet are to be elevated above the other inferior dignities.

EXCENTRIC, in *Geometry*, a term applied to circles and spheres which have not the same centre, and consequently are not parallel; in opposition to concentric, where they are parallel, having one common centre.

EXCENTRICITY, in *Astronomy*, is the distance of the centre of the orbit of a planet from the centre of the sun; that is, the distance between the centre of the ellipsis and the focus thereof.

EXCEPTION, something reserved, or set aside, and not included in a rule.

It is become proverbial, that there is no rule without an exception; intimating, that it is impossible to comprehend all the particular cases, under one and the same maxim. But it is dangerous following the exception preferably to the rule.

EXCEPTION, in *Law*, denotes a stop or stay to an action; and is either dilatory or peremptory, in proceedings at common law; but in chancery it is what the plaintiff alleges against the sufficiency of an answer, &c.

An exception is no more than the denial of what is taken to be good by the other party, either in point of law or pleading. The counsel in a cause are to take

all their exceptions to the record at one time, and before the court has delivered any opinion of it.

EXCERPT, in matters of literature. See EX-TRACT. Excerpt
||
Exchange.

EXCESS, in *Arithmetic* and *Geometry*, is the difference between any two unequal numbers or quantities, or that which is left after the lesser is taken from or out of the greater.

EXCHANGE, in a general sense, a contract or agreement, whereby one thing is given or exchanged for another.

EXCHANGE, in commerce, is the receiving or paying of money in one country for the like sum in another, by means of bills of exchange.

The security which merchants commonly take from one another when they circulate their business, is a bill of exchange, or a note of hand: these are looked upon as payment. See BILL, and *Mercantile LAWS*.

The punctuality of acquitting these obligations is essential to commerce; and no sooner is a merchant's accepted bill protested, than he is considered as a bankrupt. For this reason, the laws of most nations have given very extraordinary privileges to bills of exchange. The security of trade is essential to every society; and were the claims of merchants to linger under the formalities of courts of law when liquidated by bills of exchange, faith, confidence, and punctuality, would quickly disappear, and the great engine of commerce would be totally destroyed.

A regular bill of exchange is a mercantile contract, in which four persons are concerned, viz. 1. The drawer, who receives the value: 2. His debtor, in a distant place, upon whom the bill is drawn, and who must accept and pay it: 3. The person who gives value for the bill, to whose order it is to be paid: and, 4. The person to whom it is ordered to be paid, creditor to the third.

By this operation, reciprocal debts, due in two distant parts, are paid by a sort of transfer, or permutation of debtors and creditors.

(A) in London is creditor to (B) in Paris, value 100l. (C) again in London is debtor to (D) in Paris for a like sum. By the operation of the bill of exchange, the London creditor is paid by the London debtor; and the Paris creditor is paid by the Paris debtor; consequently the two debts are paid, and no money is sent from London to Paris nor from Paris to London.

In this example, (A) is the drawer, (B) is the acceptor, (C) is the purchaser of the bill, and (D) receives the money. Two persons here receive the money, (A) and (D); and two pay the money, (B) and (C); which is just what must be done when two debtors and two creditors clear accounts.

This is the plain principle of a bill of exchange. From which it appears, that reciprocal and equal debts only can be acquitted by them.

When it therefore happens, that the reciprocal debts of London and Paris (to use the same example) are not equal, there arises a balance on one side. Suppose London to owe Paris a balance, value 100l. How can this be paid? Answer, it may either be done with or without the intervention of a bill.

With a bill, if an exchanger, finding a demand for a bill upon Paris for the value of 100l. when Paris owes

Exchange. owes no more to London sends 100l. to his correspondent at Paris in coin, at the expence (suppose) of 11. and then, having become creditor on Paris, he can give a bill for the value of 100l. upon his being repaid his expence, and paid for his risk and trouble.

Or it may be paid without a bill, if the London debtor sends the coin himself to his Paris creditor, without employing an exchanger.

This last example shows of what little use bills are in the payment of balances. As far as the debts are equal, nothing can be more useful than bills of exchange; but the more they are useful in this easy way of business, the less profit there is to any person to make a trade of exchange, when he is not himself concerned either as debtor or creditor.

When merchants have occasion to draw and remit bills for the liquidation of their own debts, active and passive, in distant parts, they meet upon 'Change; where, to pursue the former examples, the creditors upon Paris, when they want money for bills, look out for those who are debtors to it. The debtors to Paris again, when they want bills for money, seek for those who are creditors upon it.

This market is constantly attended by brokers, who relieve the merchant of the trouble of searching for those he wants. To the broker every one communicates his wants, so far as he finds it prudent; and by going about among all the merchants, the broker discovers the side upon which the greater demand lies, for money or for bills.

He who is the demander in any bargain, has constantly the disadvantage in dealing with him of whom he demands. This is nowhere so much the case as in exchange, and renders secrecy very essential to individuals among the merchants. If the London merchants want to pay their debts to Paris, when there is a balance against London, it is their interest to conceal their debts, and especially the necessity they may be under to pay them; from the fear that those who are creditors upon Paris would demand too high a price for the exchange over and above par.

On the other hand, those who are creditors upon Paris, when Paris owes a balance to London, are as careful in concealing what is owing to them by Paris, from the fear that those who are debtors to Paris would avail themselves of the competition among the Paris creditors, in order to obtain bills for their money, below the value of them, when at par. A creditor upon Paris, who is greatly pressed for money at London, will willingly abate something of his debt, in order to get one who will give him money for it.

From the operation carried on among merchants upon 'Change, we may discover the consequence of their separate and jarring interests. They are constantly interested in the state of the balance. Those who are creditors on Paris, fear the balance due to London; those who are debtors to Paris, dread a balance due to Paris. The interest of the first is to dissemble what they fear; that of the last, to exaggerate what they wish. The brokers are those who determine the course of the day; and the most intelligent merchants are those who despatch their business before the fact is known.

Now, how is trade in general interested in the que-

tion, Who shall outwit, and who shall be outwitted, Exchange. in this complicated operation of exchange among merchants?

The interest of trade and of the nation is principally concerned in the proper method of paying and receiving the balances. It is also concerned in preserving a just equality of profit and loss among all the merchants, relative to the real state of the balance. Unequal competition among men engaged in the same pursuit, constantly draws along with it bad consequences to the general undertaking; and secrecy in trade will be found, upon examination, to be much more useful to merchants in their private capacity, than to the trade they are carrying on.

Merchants endeavour to simplify their business as much as possible; and commit to brokers many operations which require no peculiar talents to execute. This of exchange is of such a nature, that it is hardly possible for a merchant to carry on the business of his bills, without their assistance, upon many occasions. When merchants come upon 'Change, they are so full of fear and jealousies, that they will not open themselves to one another, lest they should discover what they want to conceal. The broker is a confidential man, in some degree, between parties, and brings them together.

Besides the merchants who circulate among themselves their reciprocal debts and credits arising from their importation and exportation of goods, there is another set of merchants who deal in exchange; which is the importation and exportation of money and bills.

Were there never any balance on the trade of nations, exchangers and brokers would find little employment: reciprocal and equal debts would easily be transacted openly between the parties themselves. No man feigns and dissembles, except when he thinks he has an interest in so doing.

But when balances come to be paid, exchange becomes intricate; and merchants are so much employed in particular branches of business, that they are obliged to leave the liquidation of their debts to a particular set of men, who make it turn out to the best advantage to themselves.

Whenever a balance is to be paid, that payment costs, as we have seen, an additional expence to those of the place who owe it, over and above the value of the debt.

If, therefore, this expence be a loss to the trading man, he must either be repaid this loss by those whom he serves, that is, by the nation; or the trade he carries on will become less profitable.

Every one will agree, that the expence of high exchange upon paying a balance is a loss to a people, no way to be compensated by the advantages they reap from enriching the few individuals among them who gain by contriving methods to pay it off; and if an argument is necessary to prove this proposition, it may be drawn from this principle, viz whatever renders the profit upon trade precarious or uncertain, is a loss to trade in general; this loss is the consequence of high exchange; and although a profit does result from it upon one branch of trade, the exchange business, yet that cannot compensate the loss upon every other.

We

Exchange. We may, therefore, here repeat what we have said above, that the more difficulty is found in paying a balance, the greater is the loss to a nation.

The Course of Exchange.

The course of exchange is the current price betwixt two places, which is always fluctuating and unsettled, being sometimes above and sometimes below par, according to the circumstances of trade.

When the course of exchange rises above par, the country where it rises may conclude for certain, that the balance of trade runs against them. The truth of this will appear, if we suppose Britain to import from

any foreign place goods to the value of 100,000l. at Exchange par, and export only to the value of 80,000l. In this case, bills on the said foreign place will be scarce in Britain, and consequently will rise in value; and after the 80,000l. is paid, bills must be procured from other places at a high rate to pay the remainder, so that perhaps 120,000l. may be paid for bills to discharge a debt of 100,000l.

Though the course of exchange be in a perpetual flux, and rises or falls according to the circumstances of trade; yet the exchanges of London, Holland, Ham-
burgh, and Venice, in a great measure regulate those of all other places in Europe.

I. *Exchange with Holland.*

MONEY TABLE.

8 Pennings, or 2 duytes, 2 Groats, or 16 pennings, 6 Stivers, or 12 pence, 20 Schillings, 20 Stivers, or 40 pence, 6 Guilders, or florins, 2½ Guilders, or florins,	}	make	<i>Par in Sterling.</i> 1 groat or penny = 0 0.54 1 stiver = 0 1.09 1 schilling = 0 6.56 1 pound Flemish = 10 11.18 1 gilder or florin = 1 9.86 1 pound Flemish = 10 11.18 1 rixdollar = 4 6.66
---	---	------	--

In Holland there are two sorts of money, bank and current. The bank is reckoned good security; demands on the bank are readily answered; and hence bank money is generally rated from 3 to 6 per cent. better than the current. The difference between the bank and current money is called the *agio*.

Bills on Holland are always drawn in bank money; and if accounts be sent over from Holland to Britain in current money, the British merchant pays these accounts by bills, and in this case has the benefit of the *agio*.

PROB. I. *To reduce bank money to current money.*

RULE. As 100 to 100 + *agio*, so the given guilders to the answer.

EXAMP. What will 2210 guilders in bank money amount to in Holland currency, the *agio* being 3⅓ per cent.?

Guild. As 100 : 103⅓ :: 2210 8 8 825 <hr/> 800 825 11050 4420 17680 <hr/> Guild. st. pen. 8 00)18232 50(2279 1 4 cur. 16...20 <hr/> 22 10 00(16 8 <hr/> 63 2 56 16 <hr/> 72 32 72 32

Or, by practice.

50)2210	= 2 per cent.
44.2	= 1 per cent.
22.1	= ⅓ per cent.
2.7625	

2279.0625

If the *agio* only be required, make the *agio* the middle term, thus:

Guild. st. pen.

As 100 : 3⅓ :: 2210 : 69 1 4 *agio*. Or work by practice as above.

PROB. II. *To reduce current money to bank money.*

RULE. As 100 + *agio* to 100, so the given guilders to the answer.

EXAMPLE. What will 2279 guilders 1 stiver 4 pennings, Holland currency, amount to in bank money, the *agio* being 3⅓ per cent.?

Guild. Guild. Guild. st. pen. As 103⅓ : 100 :: 2279 1 4 8 8 20 <hr/> 825 800 45581 20 16 <hr/> 16500 273490 16 45581 <hr/> 990 729300 165 800 <hr/> 8)264 000 8)583440 000 3)33 3)72930 Guild. 11 11)24310(2210 bank.
--

Exchange. An Amsterdā, Rotterdam, Middleburgh, &c. books and accounts are kept by some in guilders, stivers, and pennings, and by others in pounds, shillings, and pence Flemish.

Britain gives 1l. sterling for an uncertain number of shillings and pence Flemish. The par 1l. sterling for 36.59s. Flemish; that is, 1l. 16s. 7.08d. Flemish.

When the Flemish rate rises above par, Britain gains and Holland loses by the exchange, and *vice versa*.

Sterling money is changed into Flemish, by saying,

As 1l. sterling to the given rate,

So is the given sterling to the Flemish sought.

Or, the Flemish money may be cast up by practice.

Dutch money, whether pounds, shillings, pence Flemish, or guilders, stivers, pennings, may be changed into sterling, by saying.

As the given rate to 1l. sterling.

So the given Dutch to the sterling sought.

EXAMPLE I. A merchant in Britain draws on Amsterdā for 782l. sterling: How many pounds Flemish, and how many guilders, will that amount to, exchange at 34s. 8d. per pound sterling?

L. s. d. L.	L. s. L.
If 1 : 34 8 :: 782 <hr style="width: 50%; margin-left: 0;"/> 12 <hr style="width: 50%; margin-left: 0;"/> 416 782 <hr style="width: 50%; margin-left: 0;"/> 832 3328 <hr style="width: 50%; margin-left: 0;"/> 2912	If 1 : 34.8 :: 782 <hr style="width: 50%; margin-left: 0;"/> 782 <hr style="width: 50%; margin-left: 0;"/> 698 27733 <hr style="width: 50%; margin-left: 0;"/> 242666 2 0)2710 9.3 <hr style="width: 50%; margin-left: 0;"/> L. 1355 9 4 <i>Flem.</i>

12)325312
d.
 2|0)2710|9 4
 L. 1355 9 4 *Flem.*

By practice.	Or thus:																							
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding-right: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="text-align: right;">L. s. d.</td> </tr> <tr> <td>10s. = $\frac{1}{10}$</td> <td style="text-align: right;">782</td> </tr> <tr> <td>4s. = $\frac{1}{25}$</td> <td style="text-align: right;">391</td> </tr> <tr> <td>8d. = $\frac{1}{15}$</td> <td style="text-align: right;">156 8</td> </tr> <tr> <td></td> <td style="text-align: right;">26 1 4</td> </tr> <tr> <td></td> <td style="text-align: right; border-top: 1px solid black;">1355 9 4 <i>Fl.</i></td> </tr> </table> </td> <td style="width: 50%; padding-left: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="text-align: right;">L. s. d.</td> </tr> <tr> <td>14s. = $\frac{7}{10}$</td> <td style="text-align: right;">782</td> </tr> <tr> <td>8d. = $\frac{1}{15}$</td> <td style="text-align: right;">547 8</td> </tr> <tr> <td></td> <td style="text-align: right;">26 1 4</td> </tr> <tr> <td></td> <td style="text-align: right; border-top: 1px solid black;">1355 9 4 <i>Fl.</i></td> </tr> </table> </td> </tr> </table>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="text-align: right;">L. s. d.</td> </tr> <tr> <td>10s. = $\frac{1}{10}$</td> <td style="text-align: right;">782</td> </tr> <tr> <td>4s. = $\frac{1}{25}$</td> <td style="text-align: right;">391</td> </tr> <tr> <td>8d. = $\frac{1}{15}$</td> <td style="text-align: right;">156 8</td> </tr> <tr> <td></td> <td style="text-align: right;">26 1 4</td> </tr> <tr> <td></td> <td style="text-align: right; border-top: 1px solid black;">1355 9 4 <i>Fl.</i></td> </tr> </table>		L. s. d.	10s. = $\frac{1}{10}$	782	4s. = $\frac{1}{25}$	391	8d. = $\frac{1}{15}$	156 8		26 1 4		1355 9 4 <i>Fl.</i>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="text-align: right;">L. s. d.</td> </tr> <tr> <td>14s. = $\frac{7}{10}$</td> <td style="text-align: right;">782</td> </tr> <tr> <td>8d. = $\frac{1}{15}$</td> <td style="text-align: right;">547 8</td> </tr> <tr> <td></td> <td style="text-align: right;">26 1 4</td> </tr> <tr> <td></td> <td style="text-align: right; border-top: 1px solid black;">1355 9 4 <i>Fl.</i></td> </tr> </table>		L. s. d.	14s. = $\frac{7}{10}$	782	8d. = $\frac{1}{15}$	547 8		26 1 4		1355 9 4 <i>Fl.</i>
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="text-align: right;">L. s. d.</td> </tr> <tr> <td>10s. = $\frac{1}{10}$</td> <td style="text-align: right;">782</td> </tr> <tr> <td>4s. = $\frac{1}{25}$</td> <td style="text-align: right;">391</td> </tr> <tr> <td>8d. = $\frac{1}{15}$</td> <td style="text-align: right;">156 8</td> </tr> <tr> <td></td> <td style="text-align: right;">26 1 4</td> </tr> <tr> <td></td> <td style="text-align: right; border-top: 1px solid black;">1355 9 4 <i>Fl.</i></td> </tr> </table>		L. s. d.	10s. = $\frac{1}{10}$	782	4s. = $\frac{1}{25}$	391	8d. = $\frac{1}{15}$	156 8		26 1 4		1355 9 4 <i>Fl.</i>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="text-align: right;">L. s. d.</td> </tr> <tr> <td>14s. = $\frac{7}{10}$</td> <td style="text-align: right;">782</td> </tr> <tr> <td>8d. = $\frac{1}{15}$</td> <td style="text-align: right;">547 8</td> </tr> <tr> <td></td> <td style="text-align: right;">26 1 4</td> </tr> <tr> <td></td> <td style="text-align: right; border-top: 1px solid black;">1355 9 4 <i>Fl.</i></td> </tr> </table>		L. s. d.	14s. = $\frac{7}{10}$	782	8d. = $\frac{1}{15}$	547 8		26 1 4		1355 9 4 <i>Fl.</i>	
	L. s. d.																							
10s. = $\frac{1}{10}$	782																							
4s. = $\frac{1}{25}$	391																							
8d. = $\frac{1}{15}$	156 8																							
	26 1 4																							
	1355 9 4 <i>Fl.</i>																							
	L. s. d.																							
14s. = $\frac{7}{10}$	782																							
8d. = $\frac{1}{15}$	547 8																							
	26 1 4																							
	1355 9 4 <i>Fl.</i>																							

Multiply the Flemish pounds and shillings by 6, and the product will be guilders and stivers; and if there be any pence, multiply them by 8 for pennings: or, divide the Flemish pence by 40, and the quot will be guilders, and the half of the remainder, if there be any, will be stivers, and one penny odd will be half a stiver, or 8 pennings, as follows:

<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="text-align: right;">L. s. d.</td> </tr> <tr> <td></td> <td style="text-align: right;">1355 9 4</td> </tr> <tr> <td></td> <td style="text-align: right; border-top: 1px solid black;">6</td> </tr> </table> <p><i>Guild.</i> 8131 16 <i>stiv.</i></p>		L. s. d.		1355 9 4		6	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="text-align: right;">Flem. pence.</td> </tr> <tr> <td></td> <td style="text-align: right;">4 0)32531 2(32 <i>rem.</i></td> </tr> </table> <p><i>Guild.</i> 8132 16 <i>stiv.</i></p>		Flem. pence.		4 0)32531 2(32 <i>rem.</i>
	L. s. d.										
	1355 9 4										
	6										
	Flem. pence.										
	4 0)32531 2(32 <i>rem.</i>										

z. Change 591l. 5s. Flemish into sterling money, exchange at 37s. 6d. Flemish per 1. Sterling.

Exchange.
Flem. Ster. *Flem.*
s. d. L. *L. s.*
 If 37 6 : 1 :: 591 5

2 <hr style="width: 50%; margin-left: 0;"/> 5)75 <hr style="width: 50%; margin-left: 0;"/> 4)15 <hr style="width: 50%; margin-left: 0;"/> 3	20 <hr style="width: 50%; margin-left: 0;"/> 11825 2 <hr style="width: 50%; margin-left: 0;"/> 5)23650 <hr style="width: 50%; margin-left: 0;"/> 5) 4730 <hr style="width: 50%; margin-left: 0;"/> 3) 946 <hr style="width: 50%; margin-left: 0;"/>
--	---

L. s. d. 315 $\frac{1}{2}$
Ans. 315 5 8 *Ster.*

Decimally.
 5) L. L. 5) L.
 If 1.875 : 1 :: 591.25

5) .375 5) .075 .015	5) 118.25 5) 23.65 .015) 4.73(313.8 45
----------------------------	---

23
 15

 80
 75

 50
 45

 *5

Holland exchanges with other nations as follows, viz. with.

	Flem. d.
Hamburgh, on the dollar,	= 66 $\frac{2}{3}$
France, on the crown,	= 54
Spain, on the ducat,	= 109 $\frac{2}{3}$
Portugal, on the crusade,	= 50
Venice, on the ducat,	= 93
Genoa, on the pezzo,	= 100
Leghorn, on the piastre,	= 100
Florence, on the crown,	= 120
Naples, on the ducat,	= 74 $\frac{2}{3}$
Rome, on the crown,	= 136
Milan, on the ducat,	= 102
Bologna, on the dollar,	= 94 $\frac{2}{3}$

Exchange between Britain and Antwerp, as also the Austrian Netherlands, is negotiated the same way as with Holland; only the par is somewhat different, as will be described in article 2d, following.

II. Exchange with Hamburgh.

MONEY TABLE.

			Par in Sterling.	s.	d.
12 Phenning	}	make	1 schilling-lub	= 0	1 $\frac{1}{8}$
16 Schilling-lubs			1 mark	= 1	6
2 Marks			1 dollar	= 3	0
3 Marks			1 rixdollar	= 4	6
6 $\frac{1}{2}$ Marks			1 ducat	= 9	4 $\frac{1}{2}$

Books

Exchange.

Books and accounts are kept at the bank, and by most people in the city, in marks, schilling-lubs, and phennings; but some keep them in pounds, schillings, and groots Flemish.

The agio at Hamburgh runs between 20 and 40 per cent. All bills are paid in bank money.

Hamburgh exchanges with Britain by giving an uncertain number of schillings and groots Flemish for the pound sterling. The groot or penny Flemish here, as also at Antwerp, is worth $\frac{5}{8}$ of a penny sterling; and so something better than in Holland, where it is only $\frac{5}{100}$ d. sterling.

Flemish.

6 Phennings	} makes	{	1 groot or penny
6 Schilling-lubs			1 schilling
1 Schilling-lub			2 pence or groots
1 Mark			32 pence or groots
7½ Marks			1 pound.

The par with Hamburgh, and also with Antwerp, is 35s. 6¾d. Flemish for 1l. sterling.

EXAMPLES. I. How many marks must be received at Hamburgh for 300l. sterling, exchange at 35s. 3d. Flemish per l. sterling?

L.	s.	d.	L.
If 1	: 35	3	:: 300
	12		
	423		
	300		
	126900		M. sch.
	96		3965 10
	309		
	288		
	210		
	192		
	180		
	160		
	(20)		
	16		
	320		
	32		
	(0)		

Decimally.

Flem. s. Marks. Flem. s.

If 20	: 7.5	:: 35.25
4	: 1.5	:: 35.25
		1.5
		17625
		3525
4) 52.875	

Marks in 1l. sterling 13.21875 300

Marks in 300l. sterling 3965.62500 16

3750
625

Schilling-lubs 10.000

2. How much sterling money will a bill of 3965 marks 10 schilling-lubs amount to, exchange at 35s. 3d. Flemish per pound sterling?

Fl.s. d.	L.St.	Mks.	sch.
If 35	3	: 1	:: 3965 10
	12		32 2
	423		7930 20d.
			11897

423) 126900 (300l. ster. 1269

Decimally.

4	: 1.5	:: 35.25
		1.5

17625
2225

4) 52.875 (13.21875
13.21875) 3965.62500 (300l. ster. 3965625

III. Exchange with France.

MONEY TABLE.

		Par in Ster.	s.	d.
12 Deniers	} make	1 fol	=	0 0 3/8
20 Sols		1 livre	=	0 9 1/2
3 Livres		1 crown	=	2 5 1/4

At Paris, Rouen, Lyons, &c. books and accounts are kept in livres, fols, and deniers; and the exchange with Britain is on the crown, or ecu, of 3 livres, or 60 fols Tournois. Britain gives for the crown an uncertain number of pence, commonly between 30 and 34, the par, as mentioned above, being 29 1/4 d.

EXAMPLE I. What sterling money must be paid in London to receive in Paris 1978 crowns 25 fols, exchange at 31 1/4 d. per crown?

Sols. d.	Cr.	fols.
If 60	: 31 1/4	:: 1978 25
		60
		253
		118705
		253
		356115
		593525
		237410

6) 3003236 15 Rem.

8) 500539 3

12) 62567 11

2) 5213 13

L. 260 13 11 1/4 Ans.
Z z

By

Exchange

By Practice.

	Cr.	Sols.
	1978	25, at 31 $\frac{1}{4}$ d.
d.	<hr/>	
30 = $\frac{1}{8}$	247	5 0
1 $\frac{1}{2}$ = $\frac{1}{10}$	12	7 3
$\frac{1}{8}$ = $\frac{1}{12}$	1	0 7 $\frac{1}{4}$
Sols. 20 = $\frac{1}{12}$	0	0 10 $\frac{1}{2}$
5 = $\frac{1}{4}$	0	0 2 $\frac{1}{2}$
	260	13 11 $\frac{1}{4}$

If you work decimally, say,

Cr. d. Ster. Cr d. Ster.
As 1 : 31.625 :: 1978.416 : 62567.427083

2. How many French livres will L. 121 : 18 : 6 sterling amount to, exchange at 32 $\frac{7}{8}$ d. per crown ?

d.	Liv.	L.	s.	d.
If 32 $\frac{7}{8}$: 3 :: 121	18	6		
<hr/>	8	20		
865	—	—		
	24	2438		
		12		
		29262		
		24		
		117048		
		58524		
	Liv.	sols.	den.	
	263)702288	(2670	5 11	Anf.
	Rem.	(78=5	fols 11	deniers.

IV. Exchange with Portugal.

MONEY TABLE.

	Par in Ster.	s.	d.	f.
400 rees	} make	1	0	0.27
1000 rees		1	0	2.7
		1	0	2.7

In Lisbon, Oporto, &c. books and accounts are generally kept in rees and millrees; and the millrees are distinguished from the rees by a mark set between them thus, 485 \times 372; that is, 485 millrees and 372 rees.

Britain, as well as other nations, exchanges with Portugal on the millree; the par, as in the table, being 67 $\frac{1}{2}$ d. sterling. The course with Britain runs from 63d. to 68d. sterling per millree.

EXAMPLE 1. How much sterling money will pay a bill of 827 \times 160 rees, exchange at 63 $\frac{1}{2}$ d. sterling per millree ?

Rees.	d.	Rees.
If 1000 : 63 $\frac{1}{2}$:: 827.160		
8		507
<hr/>		
8000	507	579012
		413580
		Rem.
8000)419370.120		2
12)52421		5d.
20)4368		8s.
		L. 218 8 5 $\frac{1}{4}$ Anf.

Exchange

By Practice.

	Rees.
	827.160, at 63 $\frac{1}{2}$ d.
d.	<hr/>
60 = $\frac{1}{4}$	206.790
3 = $\frac{1}{10}$	10.3395
$\frac{1}{8}$ = $\frac{1}{12}$.861625
= $\frac{1}{12}$.4308125
	<hr/>
	218.4219375

The rees being thousandth-parts of the millrees, are annexed to the integer, and the operation proceeds exactly as in decimals.

2. How many rees of Portugal will 500l. sterling amount to, exchange at 5s. 4 $\frac{1}{2}$ d. per millree ?

d.	Rees.	L.
If 64 $\frac{1}{2}$: 1000 :: 500		
<hr/>	8	20
517	—	—
	8000	10000
		12
		120000
		8000
	Rees.	
	517)960000000	(1856.866

V. Exchange with Spain.

MONEY TABLE.

	Par in Ster.	s.	d.
35 mervadies	} make	1	0 5 $\frac{1}{8}$
8 rials		1	3 7
375 mervadies		1	4 11 $\frac{1}{4}$

In Madrid, Bilbao, Cadiz, Malaga, Seville, and most of the principal places, books and accounts are kept in piaftres, called also dollars, rials, and mervadies; and they exchange with Britain generally on the piaftre, and sometimes on the ducat. The course runs from 35d. to 45d. sterling for a piaftre or dollar of 8 rials.

EXAMP. 1. London imports from Cadiz goods to the value of 2163 piaftres and 4 rials: How much sterling will this amount to, exchange at 38 $\frac{1}{2}$ d. sterling per piaftre ?

	Piaft.	Rials.
	2163	4 at 38 $\frac{1}{2}$ d.
d.	<hr/>	
24 = $\frac{1}{10}$	216	6
12 = $\frac{1}{2}$	108	3
2 = $\frac{1}{5}$	18	0 6
$\frac{3}{8}$ = $\frac{1}{10}$	2	5 0 $\frac{3}{4}$
$\frac{1}{8}$ = $\frac{1}{10}$	1	2 6 $\frac{3}{8}$
	<hr/>	
	345	17 1 $\frac{1}{8}$
		1 7 $\frac{3}{8}$

L. 345 18 8 $\frac{5}{8}$ Anf.

2. London remits to Cadiz 345l. 18s. 8 $\frac{5}{8}$ d. How much Spanish money will this amount to, exchange at 38 $\frac{1}{2}$ d. sterling per piaftre ?

Exchange. If sterling money be given, it may be reduced or changed into pezzos of Genoa, by reversing the former operation.

Exchange money is reduced to lire money, by being multiplied by $5\frac{1}{4}$, as follows :

<i>Pez.</i>	<i>foldi.</i>	<i>Decimally.</i>
3390	16	3390.8
	$5\frac{1}{4}$	5.75
<hr/>		<hr/>
$\frac{1}{4}$ =	16954 0	169540
$\frac{1}{4}$ =	1695 8	237356
$\frac{1}{4}$ =	847 14	169540

Lires 19497 2 Lires 19497.100
And lire money is reduced to exchange money by dividing it by $5\frac{1}{4}$.

In Milan, 1 crown	=	80
In Naples, 1 ducat	=	86
In Leghorn, 1 piaftre	=	20
In Sicily, 1 crown	=	127 $\frac{1}{2}$

VIII. *Exchange with Leghorn.*

MONEY TABLE.

12 Denari } make	{ 1 foldi	s. d. Ster.
20 Soldi } make	{ 1 piaftre	= 4 6

Books and accounts are kept in piaftres, foldi, and denari. The piaftre here confifts of 6 lires, and the lire contains 20 foldi, and the foldi 12 denari; and confequently exchange money is 6 times better than lire money. The courfe of exchange is from 47d. to 58d. fterling per piaftre.

EXAMPLE. What is the fterling value of 731 piaftres, at $55\frac{1}{2}$ each ?

<i>s.</i>	<i>d.</i>	731 piaftres, at $55\frac{1}{2}$ d.
4 or	$48 = \frac{1}{2}$	146 4
	$6 = \frac{1}{2}$	18 5 6
	$1\frac{1}{2} = \frac{1}{4}$	4 11 4 $\frac{1}{2}$

L. 169 0 10 $\frac{1}{2}$ *Ans.*

Sterling money is reduced to money of Leghorn, by reversing the former operation; and exchange money is reduced to lire money by multiplying by 6, and lire money to exchange money by dividing by 6.

100 piaftres of Leghorn are
In Naples = 134 ducats | In Geneva = 185 $\frac{1}{2}$ crowns.

Soldi of Leghorn.

In Sicily, 1 crown	=	133 $\frac{1}{2}$
In Sardinia, 1 dollar	=	95 $\frac{1}{2}$

The above are the chief places in Europe with which Britain exchanges directly; the exchanges with other places are generally made by bills on Hamburgh, Holland, or Venice. We fhall here, however, fubjoin the par of exchange betwixt Britain and moft of the other places in Europe with which ſhe has any commercial intercourfe.

	<i>Par in Sterling.</i>	<i>L. s. d.</i>	<i>Exchange.</i>
Rome,	1 crown	= 0 6 1 $\frac{1}{2}$	
Naples,	1 ducat	= 0 3 4 $\frac{1}{2}$	
Florence,	1 crown	= 0 5 4 $\frac{5}{8}$	
Milan,	1 ducat	= 0 4 7	
Bologna,	1 dollar	= 0 4 3	
Sicily,	1 crown	= 0 5 0	
Vienna,	1 rixdollar	= 0 4 8	
Augsburgh,	1 florin	= 0 3 1 $\frac{1}{2}$	
Francfort,	1 florin	= 0 3 0	
Bremen,	1 rixdollar	= 0 3 6	
Breflau,	1 rixdollar	= 0 3 3	
Berlin,	1 rixdollar	= 0 4 0	
Stetin,	1 mark	= 0 1 6	
Embden,	1 rixdollar	= 0 3 6	
Bolfenna,	1 rixdollar	= 0 3 8	
Dantzic,	13 $\frac{1}{2}$ florins	= 1 0 0	
Stockholm,	34 $\frac{1}{2}$ dollars	= 1 0 0	
Ruffia,	1 ruble	= 0 4 5	
Turkey,	1 afper	= 0 4 6	

The following places, viz. Switzerland, Nuremburgh, Leipfic, Dresden, Ofnaburgh, Brunfwic, Cologn, Liege, Strafburgh, Cracow, Denmark, Norway, Riga, Revel, Narva, exchange with Britain, when direct exchange is made, upon the rixdollar, the par being 4s. 6d. fterling.

IX. *Exchange with America and the Weft Indies.*

In North America and the Weft Indies, accounts, as in Britain, are kept in pounds, fhillings, and pence. In North America they have few coins circulating among them, and on that account have been obliged to fubftitute a paper currency for a medium of their commerce; which having no intrinsic value, is fubjected to many difadvantages, and generally fuffers a great difcount. In the Weft Indies coins are more frequent, owing to their commercial intercourfe with the Spanifh fettlements.

Exchange betwixt Britain and America, or the Weft Indies, may be computed as in the following examples :

1. The neat proceeds of a cargo from Britain to Boston amount to 845l. 17s. 6d. currency: How much is that in fterling money, exchange at 80 per cent ?

If 180 : 100	
18 : 10	L. s. d.
9 : 5 :: 845 17 6	
	5
	<hr/>
	9)4229 7 6

L. 469 18 7 $\frac{1}{2}$ Ster. *Ans.*

2. Boston remits to Britain a bill of 469l 18s. 7 $\frac{1}{2}$ d. fterling: How much currency was paid for the bill at Boston, exchange at 80 per cent. ?

If 100 : 180	L. s. d.
5 : 9 :: 469 18 7 $\frac{1}{2}$	
	9
	<hr/>
	5)4229 7 6
	845 17 6 currency. <i>Ans.</i>

3. How much fterling money will 1780l. Jamaica currency amount to, exchange to 40 per cent. ?

If

Exchange.

If 140 : 100
 14 : 10 L.
 7 : 5 :: 1780
 5
 7)8900
 1271 8 6¼ Ster. Anf.

Bills of exchange from America, the rate being high, is an expensive way of remitting money to Britain; and therefore merchants in Britain generally choose to have the debts due to them remitted home in sugar, rum, or other produce.

X. Exchange with Ireland.

At Dublin, and all over Ireland, books and accounts are kept in pounds, shillings, and pence, as in Britain; and they exchange on the 100l. sterling.

The par of one shilling sterling is one shilling and one penny Irish; and so the par of 100l. sterling is 108l. 6s. 8d. Irish. The course of exchange runs from 6 to 15 per cent.

EXAMP. 1. London remits to Dublin 586l. 10s. sterling: How much Irish money will that amount to, exchange at 9½ per cent.

L.
 If 100 : 109½ :: 586.5
 8 877
 800 : 877 41055
 41055
 46920
 800)514360.5
 642.950625

Anf. 642l. 19s. Irish.

By practice.

	586.5
p. cent.	
10 = 1/10	58.65
2 = 1/5	11.75 sub.
8 =	46.92
1 = 1/8	5.865
4/8 = 1/2	2.9325
1/8 = 1/4	.733125
9½	56.450625 add.
	642.950625

2. How much sterling will 625l. Irish amount to, exchange at 10¼ per cent.?

If 110¼ : 100 :: 625
 8 800
 883 800 883)500000(566 5 0¼ Ster. Anf.

XI. Exchange betwixt London and other places in Britain.

The several towns in Britain exchange with London

for a small premium in favour of London; such as, Exchange. 1, 1¼, &c. per cent. The premium is more or less, according to the demand for bills.

EXAMP. Edinburgh draws on London for 860l. exchange at 1¼ per cent.: How much money must be paid at Edinburgh for the bill?

	L.
	860
per cent.	
1 = 1/100	8 12
1/2 = 1/4	2 3
1/8 = 1/2	1 1 6
	11 16 6 premium.
	871 16 6 paid for the bill.

To avoid paying the premium, it is an usual practice to take the bill payable at London a certain number of days after date: and in this way of doing, 73 days is equivalent to 1 per cent.

XII. Arbitration of Exchanges.

The course of exchange betwixt nation and nation naturally rises or falls according as the circumstances and balance of trade happen to vary. Now, to draw upon and remit to foreign places, in this fluctuating state of exchange, in the way that will turn out most profitable, is the design of arbitration. Which is either simple or compound.

I. Simple Arbitration.

In simple arbitration the rates or prices of exchange from one place to other two are given; whereby is found the correspondent price between the said two places, called the *arbitrated price*, or *par of arbitration*; and hence is derived a method of drawing and remitting to the best advantage.

EXAMP. 1. If exchange from London to Amsterdam be 33s. 9d. per pound sterling; and if exchange from London to Paris be 32d per crown; what must be the rate of exchange from Amsterdam to Paris, in order to be put on a par with the other two?

Ster.	Flem.	Ster.
s.	s.	d.
If 20 : 33 9 :: 32		
12	12	
230	405	
	32	
	810	
	1215	

240)12960(54d. Flem. per crown. Anf.

2. If exchange from Paris to London be 32d. sterling per crown; and if exchange from Paris to Amsterdam be 54d. Flemish per crown: what must be the rate of exchange between London and Amsterdam, in order to be on a par with the other two?

Ster. Flem. Ster.
d. d. d.
 If 32 : 54 :: 240
 240

 216
 108
 ----- 12 s. d.

32)12960(405 (33 9 Flem. per l. Ster. *Ans.*

From these operations it appears, that if any sum of money be remitted, at the rates of exchange mentioned, from any one of the three places to the second, and from the second to the third, and again from the third to the first, the sum so remitted will come home entire, without increase or diminution.

From the par of arbitration thus found, and the course of exchange given, is deduced a method of drawing and remitting to advantage, as in the following example.

3. If exchange from London to Paris be 32d. sterling per crown, and to Amsterdam 405d. Flemish per pound sterling: and if, by advice from Holland to France, the course of exchange between Paris and Amsterdam is fallen to 52d. Flemish per crown; what may be gained per cent. by drawing on Paris, and remitting to Amsterdam?

The par of arbitration between Paris and Amsterdam in this case by Ex. 1. is 54d. Flemish per crown. Work as under.

d. St. Cr. L. St. Cr.
 If 32 : 1 :: 100 : 750 debit at Paris.
Cr. d.Fl. C. d.Fl.
 If 1 : 52 :: 750 : 39000 credit at Amsterdam.
d.Fl. L.St. d.Fl. L. s. d.Ster.
 If 405 : 1 :: 39000 : 96 5 11¹/₂ to be remitted.
 100

 3 14 0⁸/₉

But if the course of exchange between Paris and Amsterdam, instead of falling below, rise about the par of arbitration, suppose to 56d. Flemish per crown; in this case if you propose to gain by the negotiation, you must draw on Amsterdam, and remit to Paris. The computation follows:

L.St. d.Fl. L.St. d.Fl.
 If 1 : 405 :: 100 : 40500 debit at Amsterdam.
d.Fl. Cr. d.Fl. Cr.
 If 56 : 1 :: 40500 : 723¹/₂ credit at Paris.
Cr. d.St. Cr. L. s. d.Ster.
 If 1 : 32 :: 723¹/₂ : 96 8 6⁶/₇ to be remitted.
 100

 3 11 5¹/₇ gained per cent.

In negotiations of this sort, a sum for remittance is afforded out of the sum you receive for the draught; and your credit at the one foreign place pays your debt at the other.

II. *Compound Arbitration.*

In compound arbitration the rate or price of exchange between three, four, or more places, is given,

in order to find how much a remittance passing through Exchange, them all will amount to at the last place; or to find the arbitrated price, or par of arbitration, between the first place and the last. And this may be done by the following

RULES. I. Distinguish the given rates or prices into antecedents and consequents; place the antecedents in one column, and the consequents in another on the right, fronting one another by way of equation.

II. The first antecedent, and the last consequent to which an antecedent is required, must always be of the same kind.

III. The second antecedent must be of the same kind with the first consequent, and the third antecedent of the same kind with the second consequent, &c.

IV. If to any of the numbers a fraction be annexed, both the antecedent and its consequent must be multiplied into the denominator.

V. To facilitate the operation, terms that happen to be equal or the same in both columns, may be dropped or rejected, and other terms may be abridged.

VI. Multiply the antecedents continually for a divisor, and the consequents continually for a dividend, and the quot will be the answer or antecedent required.

EXAMP. 1. If London remit 1000l. sterling to Spain, by way of Holland, at 35s. Flemish per pound sterling; thence to France, at 58d. Flemish per crown; thence to Venice, at 100 crowns per 60 ducats: and thence to Spain, at 360 mervadies per ducat; how many piaftres, of 272 mervadies, will the 1000l. sterling amount to in Spain?

<i>Antecedents.</i>	<i>Consequents.</i>	<i>Abridged.</i>
1l. Sterling	= 35s. or 420d. Fl.	1 = 210
58d. Flemish	= 1 crown France	29 = 1
100 crowns France	= 60 ducats Venice	1 = 30
1 ducat Venice	= 360 mervadies Spain	1 = 45
272 mervadies	= 1 piaftre	17 = 1
How many piaftres = 1000l. sterling		= 10

In order to abridge the terms, divide 58 and 420 by 2, and you have the new antecedent 29, and the new consequent 210; reject two ciphers in 100 and 1000; divide 272 and 360 by 8, and you have 34 and 45; divide 34 and 60 by 2, and you have 17 and 30; and the whole will stand abridged as above.

Then, 29 × 17 = 493 divisor; and 210 × 30 × 45 × 10 = 2835000 dividend; and, 493)2835000(5750¹/₂ piaftres. *Ans.*

Or, the consequents may be connected with the sign of multiplication, and placed over a line by way of numerator; and the antecedents, connected in the same manner, may be placed under the line, by way of denominator; and then abridged as follows:

$$\frac{420 \times 60 \times 360 \times 100}{58 \times 100 \times 272} = \frac{210 \times 60 \times 360 \times 10}{29 \times 1 \times 272}$$

$$= \frac{210 \times 60 \times 45 \times 10}{29 \times 34} = \frac{210 \times 30 \times 45 \times 10}{29 \times 17}$$

$$= \frac{2835000}{493}$$

And, 493)2835000(5750¹/₂ piaftres. *Ans.*

The placing the terms by way of antecedent and consequent,

Exchange. frequent, and working as the rules direct, saves so many statings of the rule of three, and greatly shortens the operation. The proportions at large for the above question would be stated as under.

<i>L. St. d. Fl.</i>	<i>L. St.</i>	<i>d. Fl.</i>
If 1 : 420 ::	1000 :	420000
<i>d. Fl. Cr.</i>	<i>d. Fl.</i>	<i>Cr.</i>
If 58 : 1 ::	420000 :	7241 $\frac{1}{4}$ $\frac{1}{9}$
<i>Cr. Duc.</i>	<i>Cr.</i>	<i>Duc.</i>
If 100 : 60 ::	7241 $\frac{1}{2}$ $\frac{1}{9}$:	4344 $\frac{2}{3}$ $\frac{4}{9}$
<i>Duc. Mer.</i>	<i>Duc.</i>	<i>Mer.</i>
If 1 : 360 ::	4344 $\frac{2}{3}$ $\frac{4}{9}$:	1564137 $\frac{2}{3}$ $\frac{7}{9}$
<i>Mer. Piaſt.</i>	<i>Mer.</i>	<i>Piaſt.</i>
If 272 : 1 ::	1564137 $\frac{2}{3}$ $\frac{7}{9}$:	5750 $\frac{2}{3}$ $\frac{6}{9}$

If we suppose the course of direct exchange to Spain to be 42 $\frac{1}{2}$ d. sterling per piaſtre, the 1000l. remitted would only amount to 5647 $\frac{1}{2}$ piaſtres; and, consequently, 103 piaſtres are gained by the negotiation; that is, about 2 per cent.

2. A banker in Amsterdam remits to London 400l. Flemish; first to France at 56d. Flemish per crown; from France to Venice, at 100 crowns per 60 ducats; from Venice to Hamburg, at 100d. Flemish per ducat; from Hamburg to Lisbon, at 50d. Flemish per crusade of 400 rees; and, lastly, from Lisbon to London at 64d. sterling per millree: How much sterling money will the remittance amount to? and how much will be gained or saved, supposing the direct exchange from Holland to London at 36s. 10d. Flemish per pound sterling?

<i>Antecedents.</i>	<i>Consequents.</i>
36d. Flem. = 1 crown.	
100 crowns = 60 ducats.	
1 ducat = 100d. Flem.	
50d. Flem. = 400 rees.	
1000 rees = 64d. sterling.	
How many d. ster. = 400l. or 96000d. Flemish?	

This, in the fractional form, will stand as follows.

$$\frac{60 \times 100 \times 400 \times 64 \times 96000}{65 \times 100 \times 50 \times 1000} = \frac{368640}{7}, \text{ and}$$

7)368640(52662 $\frac{2}{3}$ d. ster. = 219l. 8s. 6 $\frac{2}{3}$ d. ster. *Ans.*

To find how much the exchange from Amsterdam directly to London, at 36s. 10d. Flemish per l. sterling, will amount to, say,

<i>s. d.</i>	<i>d. Fl.</i>	<i>L. St.</i>	<i>d. Fl.</i>	<i>L.</i>	<i>s.</i>	<i>d. St.</i>
36	10	If 442 : 1 ::	96000 :	217	3	10 $\frac{1}{2}$
12				219	8	6 $\frac{1}{4}$
				<hr/>		
442			Gained or saved;	2	4	8 $\frac{1}{4}$

In the above example, the par of arbitration, or the arbitrated price, between London and Amsterdam, viz. the number of Flemish pence given for 1l. sterling, may be found thus:

Make 64d. sterling, the price of the millree, the first antecedent; then all the former consequents will become antecedents, and all the antecedents will become consequents. Place 240, the pence in 1l. sterling, as the last consequent, and then proceed as taught above, viz.

Exchange.

Antecedents. *Consequents.*

64d. ster.	=	1000 rees.
400 rees	=	50d. Flem.
100d. Flem.	=	1 ducat.
60 ducats	=	100 crowns.
1 crown	=	56d. Flem.

How many d. Flem. = 240 ster.?

$$\frac{1000 \times 50 \times 100 \times 56 \times 240}{64 \times 400 \times 100 \times 60} = \frac{875}{2}, \text{ and}$$

2)875(437 $\frac{1}{2}$ d. = 36s. 5 $\frac{1}{2}$ d. Flem. per l. ster. *Ans.*

Or the arbitrated price may be found from the answer to the question, by saying

d. Ster. *d. Flem.* *d. St.*

If 36 $\frac{8}{7}$ $\frac{6}{40}$: 96000 :: 240

$$\begin{array}{r} 7 \\ \hline 672000 \\ 240 \end{array}$$

$$\begin{array}{r} 2688 \\ 1344 \end{array}$$

d. *s.* *d. Flem.*

368640)161280000(437 $\frac{1}{2}$ = 36 5 $\frac{1}{2}$ as before.

The work may be proved by the arbitrated price thus: As 1l. sterling to 36s. 5 $\frac{1}{2}$ d. Flemish, so 219l. 8s. 6 $\frac{2}{3}$ d. sterling to 400l. Flemish.

The arbitrated price compared with the direct course shows whether the direct or circular remittance will be most advantageous, and how much. Thus the banker at Amsterdam will think it better exchange to receive 1l. sterling for 36s. 5 $\frac{1}{2}$ d. Flemish, than for 36s. 10d. Flemish.

EXCHANGE, signifies also a place in most considerable trading cities, wherein the merchants, negotiants, agents, bankers, brokers, interpreters, and other persons concerned in commerce, meet on certain days, and at certain times thereof, to confer and treat together of matters relating to exchanges, remittances, payments, adventures, assurances, freightments, and other mercantile negotiations, both by sea and land.

In Flanders, Holland, and several cities of France, these places are called *burſes*; at Paris and Lyons, *places de change*; and in the Hanſe towns, *colleges of merchants*. These assemblies are held with so much exactness, and merchants and negotiants are so indispensably required to attend at them, that a person's absence alone makes him be suspected of a failure or bankruptcy. The most considerable exchanges in Europe, are that of Amsterdam; and that of London, called the *Royal Exchange*.

Even in the time of the ancient Romans, there were places for the merchants to meet, in most of the considerable cities of the empire. That said by some to have been built at Rome in the year of the city 259, 493 years before our Saviour, under the consulate of Appius Claudius and Publius Servilius, was called *collegium mercatorium*; whereof it is pretended there are still some remains, called by the modern Romans *loggia*, the lodge; and now usually the place of St George. This notion of a Roman exchange is supposed to be founded

Exchange. founded on the authority of Livy, whose words are as follows: viz. *Certamen consulibus incidemat, uter dedicaret Mercurii aedem. Senatus à se rem ad populum rejicit: utri eorum dedicatio jussu populi data esset, eum præesse anone, mercatorum collegium instituere jussit.* Liv. lib. ii. But it must be here remarked, that *collegium* never signified a building for a society in the purer ages of the Latin tongue; so that *collegium mercatorum instituere* must not be rendered to build an exchange for the merchants, but to incorporate the merchants into a company. As Mercury was the god of traffick, this *aedes Mercurii* seems to have been chiefly designed for the devotions of this company or corporation.

EXCHANGE, Bills of. The following information concerning the origin of bills of exchange is extracted from Beckmann's History of Inventions.

"I shall not here repeat (says he) what has been collected by many learned men respecting the important history of this noble invention, but only lay before my readers an ordinance of the year 1394, concerning the acceptance of bills of exchange, and also two bills of the year 1404, as they may serve to illustrate farther what has been before said on the subject by others. These documents are, indeed, more modern than those found by Raphael de Turre in the writings of the jurist Baldus, which are dated March the 9th 1328; but they are attended with such circumstances as sufficiently prove that the method of transacting business by bills of exchange was fully established so early as the fourteenth century; and that the present form and terms were even then used. For this important information I am indebted to Mr Von Martens, who found it in a book which, as far as I know, has never been noticed in any literary journal, though it is much more deserving of attention than many others better known. It is a history, written in Spanish, of the maritime trade and other branches of commerce at Barcelona, taken entirely from the archives of that city, and accompanied with documents from the same source, which abound with matter highly interesting (A).

"Among these is an ordinance issued by the city of Barcelona in the year 1394, that bills of exchange should be accepted within twenty-four hours after they were presented; and that the acceptance should be written on the back of the bill.

"In the year 1404, the magistrates of Bruges, in Flanders, requested the magistrates of Barcelona to inform them what was the common practice, in regard to bills of exchange, when the person who presented a bill raised money on it in an unusual manner, in the case of its not being paid, and by these means increased the expenses so much that the drawer would not consent to

sustain the loss. The bill which gave occasion to this *Exchange* question is inserted in the memorial. It is written in the short form still used; which certainly seems to imply great antiquity. It speaks of usance; and it appears that first and second bills were at that time drawn, and that when bills were not accepted, it was customary to protest them.

"As this article is of great importance I shall here transcribe it, from vol. ii. p. 203: "Cum de mensibus Aprilis et Maii ultimo elapsis Antonius Quarti, mercator Lucanus residens in villa Burgensi, a Joanne Colom, mercatore civitatis Barchinonæ, etiam residente in prædicta villa Brugensi, duo millia scutorum Philippi, quolibet scuto pro xxii grossis computato, solvendi per Franciscum de Prato mercatorem Florentiæ, more solito, in Barchinona, mediatim Petro Gilberto et Petro Olivo, et mediatim Petro Scorp, et supradicto Petro Gilberto, mercatoribus Cardonæ: prout de dictis cambiis apparet quatuor litteris papireis, quarum tenores subsequuntur.

"Superscriptio autem primæ litteræ fuit talis: *Franc. do Prato et comp. à Barselona.* Tenor vero eiusdem ad intra fuit talis: *Al nome di Dio, Amen. à di xxviii. Aprile 1404. Pagate per questa prima di camb. à usanza à Piero Gilberto, è Piero Olivo scuti mille à sold. x. Barselonesi per scuto, i quali scuti mille sono per cambio che con Giovanni Colombo à grossi xxii. di g. scuto: et pag. à nostro conto, et Christo vi guardi.* Subtus vero erat scriptum: *Antonio Quarti Sal. de Bruggias.*

"Superscriptio vero secundæ litteræ fuit talis: *Francisco de Prato et comp. à Barselona.* Et ab intra sic habebatur: *Al nome de Dio, Amen. à di xviii. di Maggio 1404. Pagate per questa prima di camb. à usanza à Piero Gilberto et à P. de Scorpo scuti mille de Felippo à sold. x. Barselonesi per scuto: i quali scuti mille sono per camb. che con Giov. Colombo à grossi xxii. di g. scuto: et pag. à nostro conto: et Christo vi guardi.* Subtus vero erat sic scriptum: *Ant. Quadri Sal. de Bruggias.*"* * Vol. iii

Bills of exchange are justly considered as of the great importance to the interest of commerce; but several queries have been proposed respecting them, which do not as yet appear to have received a satisfactory solution. It still seems to be a disputed point, whether the law ought to consider them as nothing more than a deposit belonging to the drawer, and successively confided to the remittees; or as property capable of being transferred, and entirely vested in the holder at all times, who should be alone responsible for neglecting it, when its value is vitiated.

Professor Busch of Hamburg thought that bills of exchange should always be viewed as the exclusive property of the person holding them, which, in a work published

(A) "*Memorias historicas sobre la marina comercio y artes de la antigua ciudad de Barcelona, por D. Antonio de Capmany y de Montpalau.* Madrid 1779, 2 vol. 4to. As a proof of what I have said above, I shall mention the following important articles, which may be found in this work. A custom-house tariff, written in Latin, of the year 1221, in which occur a great number of remarkable names and articles of merchandise not explained. Another of the like kind of the year 1252. Letters of power to appoint consuls in distant countries, such as Syria, Egypt, &c. dated in the years 1266, 1268, and 1321. An ordinance of the year 1458, respecting insurance, which required that under-writing should be done in the presence of a notary, and declared *policies à scripturas privadas* to be null and void. A *privilegium* of the emperor Andronicus II. to the merchants of Barcelona, written in Greek and Spanish, in 1290. Account of the oldest Spanish trade with wool, silk, salt, and saffron; and of the oldest guilds or incorporated societies of tradesmen at Barcelona, &c."

Exchequer. published in 1792, is defended by a number of plausible arguments. This theory was applied to the difficult and fluctuating case of the holder of a bill which has several indorsements, where the drawer, the drawee, and persons early indorsing it, have all become bankrupts. Should the person holding it under each bankruptcy prove the entire amount of said bill, it is manifest that he must receive much more than he can in justice claim as his due. It seems most equitable that he should be forced to prove his debt against none but his immediate predecessor, the assignees of such predecessor being allowed a similar proof up to the drawer. To such as are frequently in the habit of discounting bills, from their commercial situations in life, this becomes a matter of the utmost consequence; for farther information concerning which, we refer our readers to the ingenious work of Professor Busch already alluded to, and to *Additions to the Theoretical and Practical Delineation of Commerce*, published in 1798 (B).

EXCHEQUER, in the British jurisprudence, an ancient court of record, in which all causes concerning the revenues and rights of the crown are heard and determined, and where the crown revenues are received. It took this name from the cloth that covered the table of the court, which was party-coloured, or chequered.

This court is said to have been erected by William the Conqueror, its model being taken from a like court established in Normandy long before that time. Anciently its authority was so great, that it was held in the king's palace, and the acts thereof were not to be examined or controlled in any other of the king's courts; but, at present, it is the last of the four courts at Westminster.

In the exchequer, some reckon seven courts, viz. those of pleas, accounts, receipts, exchequer-chamber (which is an assembly of all the judges on difficult matters in law), errors in the exchequer, errors in the king's bench, and, lastly, the court of equity in the exchequer.

But the exchequer, for the despatch of business, is generally divided into two parts; one of which is chiefly conversant in the judicial hearing and deciding of all causes relating to the king's coffers, formerly termed the *exchequer of accounts*: the other is called the *receipt of the exchequer*, as being principally employed in receiving and paying of money.

Vol. VIII. Part I.

Officers of the receipt may take one penny in the pound, as their fee, for sums issued out; and they are obliged, without delay, to receive the money brought thither; and the money received is to be put into chests under three different locks and keys, kept by three several officers. All sheriffs, bailiffs, &c. are to account in the exchequer; and in the lower part, termed the receipt, the debtors of the king, and persons in debt to them, the king's tenants, and the officers and ministers of the court, are privileged to sue one another, or any stranger, and to be sued in the like actions as are brought in the courts of king's bench and common pleas.

The judicial part of the exchequer, is a court both of law and equity. The court of law is held in the office of pleas, according to the course of common law, before the barons: in this court, the plaintiff ought to be a debtor or accountant to the king: and the leading process is either a writ of subpoena, or quo minus, which last goes into Wales, where no process out of courts of law ought to run, except a *capias utlagatum*.

The court of equity is held in the exchequer chamber, before the treasurer, chancellor, and barons; but generally, before the barons only: the lord chief baron being the chief judge to hear and determine all causes. The proceedings of this part of the exchequer are by English bill and answer, according to the practice of the court of chancery; with this difference that the plaintiff here must set forth, that he is a debtor to the king, whether he be so or not. It is in this court of equity that the clergy exhibit bills for the recovery of their tithes, &c. Here too the attorney-general exhibits bills for any matters concerning the crown; and a bill may be exhibited against the king's attorney by any person aggrieved in any cause prosecuted against him on behalf of the king, to be relieved therein: in which case, the plaintiff is to attend on the attorney general, with a copy of the bill, and procure him to give an answer thereto; in the making of which he may call in any person interested in the cause, or any officer, or others, to instruct him, that the king be not prejudiced thereby; and his answer is to be put in without oath.

But, besides the business relating to debtors, farmers, receivers, accountants, &c. all penal punishments, intrusion, and forfeitures upon popular actions, are mat-

3 A

ters

(B) In Vol. III. p. 613. under the article BILL, the old duty on stamps is mentioned, and the new entirely omitted.

The following are the duties on such stamps for the year 1805. The duty on promissory notes for the payment of money to the bearer on demand, for a sum not exceeding 1l. 1s. is 3d. For a sum exceeding 1l. 1s. and not 2l. 2s.; 6d. For a sum exceeding 2l. 2s. and not 5l. 5s.; 9d. For a sum exceeding 5l. 5s. and not 20l.; 1s.

Promissory notes by the Bank or Royal Bank of Scotland, or the British Linen Company, payable to the bearer on demand, which may within three years after the date be reissued after payment, when the sum amounts to, and shall not exceed 100l.; 5s.

Bill of exchange, draft, order, or promissory or other note, payable to the bearer on demand, for 40s. and not exceeding 5l. 5s.; 8d.—Otherwise than to the bearer on demand, when the sum shall amount to 40s. and shall not exceed 5l. 5s.; 1s.

Bills of exchange, draft, order, or promissory note for the payment of money, where the sum shall exceed 5l. 5s. and not 30l.; 1s. 6d. Exceeding 30l. and not 50l.; 2s. Above 50l. and not 100; 3s. Above 100l. and not 200; 4s. Above 200l. and not 500l.; 5s. Above 500l. and not 1000l.; 7s. 6d.

Foreign bills of exchange drawn in sets, where the sum shall not exceed 100l. for each bill in each set, 1s. Exceeding 100l. and not 200l.; 2s. Exceeding 200l. and not 500l.; 3s. Exceeding 500l. and not 1000l.; 4s.

Exchequer,
Excise.

ters likewise cognizable by this court; where there also sits a puisne-baron, who administers the oaths to high sheriffs, bailiffs, auditors, receivers, collectors, comptrollers, surveyors, and searchers of all the customs, &c.

The exchequer in Scotland has the same privileges and jurisdiction as that of England; and all matters competent to the one are likewise competent to the other.

Black Book of the EXCHEQUER, is a book under the keeping of the two chamberlains of the exchequer; said to have been composed in 1175 by Gervais of Tilbury, nephew of King Henry II. and divided into several chapters. Herein is contained a description of the court of England, as it then stood, its officers, their ranks, privileges, wages, perquisites, power, and jurisdiction; and the revenues of the crown, both in money, grain, and cattle. Here we find, that for one shilling, as much bread might be bought as would serve 100 men a whole day; that the price of a fat bullock was only 12 shillings, and a sheep four, &c.

Chancellor of the EXCHEQUER. See CHANCELLOR.

EXCHEQUER Bills. By statute 5 Ann. c. 13. the lord treasurers may cause exchequer bills to be made of any sums not exceeding 1,500,000l. for the use of the war; and the duties upon houses were made chargeable with 4l. 10s. per cent. per annum to the bank for circulating them. The bank not paying the bills, actions to be brought against the Company, and the money and damages recovered: and if any exchequer bills be lost, upon affidavit of it before a baron of the exchequer, and certificate from such baron, and security to pay the same if found, duplicates are to be made out: also when bills are defaced, new ones shall be delivered. The king, or his officers in the exchequer, by former statutes, might borrow money upon the credit of bills, payable on demand, with interest after the rate of 4l. per diem for every 100l. bill. And by 8 and 9 W. III. c. 20. an interest of 5d. a day was allowed for every 100l. But 12 W. III. c. 1. lowered the interest on these bills to 4d. a-day per cent. And by 12 Ann. c. 11. it is sunk to 2d. a-day. Forging exchequer bills, or the indorsements thereof, is felony.

EXCISE, (from the Belgic *accijffe*, tributum, "tribute,") an inland duty or imposition, paid sometimes upon the consumption of the commodity, or frequently upon the wholesale, which is the last stage before the consumption. This is doubtless, impartially speaking, the most economical way of taxing the subject; the charges of levying, collecting, and managing the excise duties, being considerably less in proportion than in other branches of the revenue. It also renders the commodity cheaper to the consumer, than charging it with customs to the same amount would do; for the reason just now given, because generally paid in a much later stage of it. But, at the same time, the rigour and arbitrary proceedings of excise laws seem hardly compatible with the temper of a free nation. For the frauds that might be committed in this branch of the revenue, unless a strict watch is kept, make it necessary, wherever it is established, to give the officers a power of entering and searching the houses of such as deal in exciseable commodities, at any hour of the day, and, in many cases, of the night likewise. And the proceedings, in case of transgressions, are so summary

and sudden, that a man may be convicted in two days time in the penalty of many thousand pounds, by two commissioners or justices of the peace; to the total exclusion of the trial by jury, and disregard of the common law. For which reason, though Lord Clarendon tells us, that to his knowledge the earl of Bedford (who was made lord treasurer by King Charles I. to oblige his parliament) intended to have set up the excise in England, yet it never made a part of that unfortunate prince's revenue; being first introduced, on the model of the Dutch prototype, by the parliament itself after its rupture with the crown. Yet such was the opinion of its general unpopularity, that when in 1642 "aspersions were cast by malignant persons upon the house of commons, that they intended to introduce excises, the house for its vindication therein did declare, that these rumours were false and scandalous, and that their authors should be apprehended and brought to condign punishment." Its original establishment was in 1643, and its progress was gradual; being at first laid upon those persons and commodities where it was supposed the hardship would be least perceivable, viz. the makers and venders of beer, ale, cyder, and perry; and the royalists at Oxford soon followed the example of their brethren at Westminster, by imposing a similar duty: both sides protesting that it should be continued no longer than to the end of the war, and then be utterly abolished. But the parliament at Westminster soon after imposed it on flesh, wine, tobacco, sugar, and such a multitude of other commodities, that it might be fairly denominated *general*: in pursuance of the plan laid down by Mr Pymme (who seems to have been the father of the excise), in his letter to Sir John Hotham, signifying, "that they had proceeded in the excise to many particulars, and intended to go on farther; but that it would be necessary to use the people to it by little and little."— And afterwards, when the nation had been accustomed to it for a series of years, the succeeding champions of liberty boldly and openly declared "the impost of excise to be the most easy and indifferent levy that could be laid upon the people;" and accordingly continued it during the whole usurpation. Upon King Charles's return, it having then been long established, and its produce well known, some part of it was given to the crown, in 12 Car. II. by way of purchase for the feudal tenures and other oppressive parts of the hereditary revenue. But, from its first original to the present time, its very name has been odious to the people. It has, nevertheless, been imposed on abundance of other commodities in the reigns of King William III. and every succeeding prince, to support the enormous expences occasioned by our wars on the continent. Thus brandies and other spirits are now excised at the distillery; printed silks and linens, at the printers; starch and hair powder, at the makers; gold and silver wire, at the wire drawers; all plate whatsoever, first in the hands of the vender, who pays yearly for a license to sell it, and afterwards in the hands of the occupier, who also pays an annual duty for having it in his custody; and coaches and other wheel-carriages, for which the occupier is excised; though not with the same circumstances of arbitrary strictness with regard to plate and coaches as in the other instances. To these we may add coffee and tea, chocolate and cocoa paste, for which the du-

Excise.

Excision || Excommu-
nication. ty is paid by the retailer; all artificial wines, commonly called *sweets*; paper and pasteboard, first made, and again if stained or printed; malt, as before mentioned; vinegars; and the manufacture of glasses; for all which the duty is paid by the manufacturer; hops, for which the person that gathers them is answerable; candles and soap, which are paid for at the makers; malt liquors brewed for sale, which are excised at the brewery; cyder and perry at the venders; leather and skins, at the tanner's; and, lately, tobacco, at the manufacturer's: A list, which no friend to his country would wish to see farther increased.

The excise was formerly farmed out: but is now managed for the king by commissioners in both kingdoms, who receive the whole product of the excise, and pay it into the exchequer. These commissioners are nine in number in England, and five in Scotland. The former have a salary of 1000l. a-year, the latter 600l. They are obliged by oath to take no fee or reward but from the king himself; and from them there lies an appeal to five other commissioners called *commissioners of appeals*.

EXCISION, in *Surgery*, the cutting out, or cutting off, any part of the body.

EXCISION, in a scripture sense, means the cutting off of a person from his people, by way of punishment for some sin by him committed. The Jews, Selden informs us, reckon 36 crimes, to which they pretend this punishment is due. The Rabbins reckon three kinds of excision; one, which destroys only the body; another, which destroys the soul only; and a third, which destroys both body and soul. The first kind of excision they pretend is an untimely death; the second is an utter extinction of the soul; and the third, a compound of the two former: thus, making the soul mortal or immortal, says Selden, according to the degrees of misbehaviour and wickedness of the people.

EXCLAMATION. See ORATORY, N^o 85.

EXCLUSION, or *Bill of Exclusion*, a bill proposed about the close of the reign of King Charles II. for excluding the duke of York, the king's brother, from the throne, on account of his being a Papist.

EXCLUSIVE, is sometimes used adjectively, thus; *A patent carries with it an exclusive privilege*. Sometimes adverbially: as, *He sent him all the numbers from N^o 145 to N^o 247 exclusive*; that is, all between these two numbers, which themselves were excepted.

EXCOECARIA, a genus of plants belonging to the dicæcia class, and in the natural method ranking under the 38th order, *Tricocææ*. See BOTANY *Index*.

EXCOMMUNICATION, an ecclesiastical penalty or censure, whereby such persons as are guilty of any notorious crime or offence, are separated from the communion of the church, and deprived of all spiritual advantages.

Excommunication is founded on a natural right which all societies have, of excluding out of their body such as violate the laws thereof; and it was originally instituted for preserving the purity of the church; but ambitious ecclesiastics converted it by degrees into an engine for promoting their own power, and inflicted it on the most frivolous occasions.

The power of excommunication, as well as other acts of ecclesiastical discipline, was lodged in the hands

of the clergy, who distinguished it into the *greater* and *lesser*. The lesser excommunication, simply called *aphorismos*, "separation or suspension," consisted in excluding men from the participation of the eucharist, and the prayers of the faithful. But they were not expelled the church; for they had the privilege of being present at the reading of the Scriptures, the sermons, and the prayers of the catechumens and penitents. This excommunication was inflicted for lesser crimes; such as neglecting to attend the service of the church, misbehaviour in it, and the like.

The greater excommunication, called *panteles aphorismos*, "total separation and anathema," consisted in an absolute and entire exclusion from the church and the participation of all its rites. When any person was thus excommunicated, notice of it was given by circular letters to the most eminent churches all over the world, that they might all confirm this act of discipline, by refusing to admit the delinquent to their communion. The consequences of this latter excommunication were very terrible. The excommunicated person was avoided in civil commerce and outward conversation. No one was to receive him into his house, nor eat at the same table with him; and when dead, he was denied the solemn rites of burial.

The Romish pontifical takes notice of three kinds of excommunication. 1. The minor, incurred by those who have any correspondence with an excommunicated person. 2. The major, which falls upon those who disobey the commands of the holy see, or refuse to submit to certain points of discipline; in consequence of which they are excluded from the church militant and triumphant, and delivered over to the devil and his angels. 3. Anathema, which is properly that pronounced by the pope against heretical princes and countries. In former ages, these papal fulminations were most terrible things; but at present, they are formidable to none but a few petty states of Italy.

Excommunication, in the Greek church, cuts off the offender from all communion with the 318 fathers of the first council of Nice, and with the saints; consigns him over to the devil and the traitor Judas; and condemns his body to remain after death as hard as a flint or piece of steel, unless he humbles himself and makes atonement for his sins by a sincere repentance. The form abounds with dreadful imprecations; and the Greeks assert, that if a person dies excommunicated, the devil enters into the lifeless corps; and therefore, in order to prevent it, the relations of the deceased cut his body in pieces, and boil them in wine. It is a custom for the patriarch of Jerusalem annually to excommunicate the pope and the church of Rome; on which occasion, together with a great deal of idle ceremony, he drives a nail into the ground with a hammer, as a mark of malediction.

The form of excommunication in the church of England anciently ran thus: By the authority of God the Father Almighty, the Son and Holy Ghost, and of Mary the blessed mother of God, we excommunicate, anathematize, and sequester from the pale of holy mother church, &c." The causes of excommunication in England are, contempt of the bishop's court, heresy, neglect of public worship and the sacraments, incontinency, adultery, simony, &c. It is described to be twofold. The less is an ecclesiastical censure,

Excommu-
nication.

sure, excluding the party from the participation of the sacraments: the greater proceeds farther, and excludes him not only from these, but from the company of all Christians. But if the judge of any spiritual court excommunicates a man for a cause of which he hath not the legal cognizance, the party may have an action against him at common law, and he is also liable to be indicted at the suit of the king.

Heavy as the penalty of excommunication is, considered in a serious light, there are, notwithstanding, many obstinate or profligate men, who would despise the *brutum fulmen* of mere ecclesiastical censures, especially when pronounced by a petty surrogate in the country, for railing or contumelious words, for non-payment of fees or costs, or other trivial cause. The common law, therefore, compassionately steps in to their aid, and kindly lends a supporting hand to an otherwise tottering authority. Imitating herein the policy of the ancient Britons, among whom, according to Cæsar, whoever were interdicted by the druids from their sacrifices, "In numero impiorum ac sceleratorum habentur: ab iis omnes decedunt, aditum eorum sermo nemque defugiunt, ne quid ex contagione incommodi accipiant: neque eis petentibus jus redditur, neque honor ullus communicatur." And so with us, by the common law, an excommunicated person is disabled to do any act that is required to be done by one that is *probus et legalis homo*. He cannot serve upon juries; cannot be a witness in any court; and, which is the worst of all, cannot bring an action, either real or personal, to recover lands or money due to him. Nor is this the whole: for if, within 40 days after the sentence has been published in the church, the offender does not submit and abide by the sentence of the spiritual court, the bishop may certify such contempt to the king in chancery. Upon which there issues out a writ to the sheriff of the county, called from the bishop's certificate a *significavit*; or from its effect, a writ *de excommunicato capiendo*: and the sheriff shall thereupon take the offender and imprison him in the county jail, till he is reconciled to the church, and such reconciliation certified by the bishop; upon which another writ *de excommunicato deliberando*, issues out of chancery to deliver and release him.

EXCOMMUNICATION was also practised among the Jews, who used to expel from their synagogue such as had committed any grievous crime. See the Gospel according to St John, ix. 22. xii. 42. xvi. 2. And Joseph. Antiq. Jud. lib. ix. cap. 22. and lib. xvi. cap. 2.

Godwyn, in his *Moses and Aaron*, distinguishes three degrees, or kinds, of excommunication among the Jews. The first he finds intimated in John ix. 22. The second in 1 Cor. v. 5. And the third in 1 Cor. xvi. 22. See NIDDUI.

The rule of the Benedictines gives the name *excommunication* to the being excluded from the oratory, and the common table of the house, in our inns of court called *discomoning*. This was the punishment of such monks as came too late.

EXCOMMUNICATION, or a being secluded from a participation in the mysteries of religion, was also in use under paganism.

Such as were thus excommunicated were forbidden to assist or attend at the sacrifices, or to enter within the temples; and were afterwards delivered over to the

demons and furies of hell, with certain imprecations; which was called among the Romands *divis devovere*. See EXECRATION.

The Druids among the ancient Britons and Gauls, likewise, made use of excommunication against rebels; and interdicted the communion of their mysteries to such as refused to acquiesce in their decisions. See DRUIDS.

EXCORIATION, in *Medicine* and *Surgery*, the galling, or rubbing off the cuticle, especially of the parts between the thighs and about the anus. In adults, it is occasioned by riding, much walking, or other vehement exercise, and may be cured by vulnerary applications. In children there is often an excoriation, not only of the parts near the pudenda, chiefly of the groin and scrotum, but likewise in the wrinkles of the neck, under the arms, and in other places; proceeding from the acrimony of urine and sweat; and occasioning itching pains, crying, watching, restlessness, &c. To remedy this, the parts affected may be often washed with warm water, and sprinkled with drying powders, as chalk, hartshorn, but especially tutty, lapis calaminaris, and cerufs, which may be tied loosely in a rag, and the powder shook out on the parts.

EXCREMENT, whatever is discharged out of the body of animals after digestion; or the fibrous part of the aliment, mixed with the bile, saliva, and other fluids. Urine and the feces are the gross excrements that are discharged out of the bladder or belly. Other excrements are the various humours that are secreted from the blood through the different strainers in the body, and which serve for several uses; such as the saliva, sweat, bile, the pancreatic juice, lymph, the semen, nails, the hair, the horns and hoofs of animals.

Alchemists, who have sought everywhere for their *great work*, as they called it, have particularly operated much on the excrements of men and other animals; but philosophical chemistry has acquired no knowledge from all these alchemical labours, from the obscurity with which their authors have described them. The philosophic chemists have not much examined animal excrements. Of these, Homberg is the only one who has particularly analyzed and examined human ordure; and this was done to satisfy an alchemical project of one of his friends, who pretended that from this matter a white oil could be obtained, without smell, and capable of fixing mercury into silver. The oil was found by Homberg, but mercury was not fixed by it.

The labours of this able chemist were not, however useless, like those of the alchemists; because he has clearly related the experiments he made on this matter, in the Memoirs of the Academy of Sciences. These experiments are curious, and teach several essential things concerning the nature of excrements. The result of these experiments is as follows: Fresh human feces, being distilled to dryness in a water bath, furnish a clear, watery, insipid liquor, of a disagreeable smell, but which contains no volatile alkali; which is a proof that this matter, although nearly in a putrefactive state, is not however putrefied; for all substances really putrid furnish with this degree of heat a manifest volatile alkali*. The dry residuum of the foregoing experiment, being distilled in a retort with a graduated fire, furnishes a volatile alkaline spirit and salt,

Excoria-
tion,
Excrement.* See Pu-
refaction.

Excre-
cence
||
Excat.

salt, a fetid oil, and leaves a residuous coal. These are the same substances which are obtained from all animal matters.

Human feces, diluted and lixiviated in water, furnish by filtration and evaporation of the water an oily salt of a nitrous nature, which deflagrates like nitre upon ardent coals, and which inflames in close vessels when heated to a certain degree. The same matter yielded to Homberg, who treated it by a complete fermentation or putrefaction, excited by a digestion during 40 days in a gentle water-bath heat, and who afterwards distilled it, an oil without colour, and without bad smell, and such as he endeavoured to find; but which did not, as we said before, fix mercury into silver.

EXCRESCENCE, in *Surgery*, denotes every preternatural tumour which arises upon the skin, either in the form of a wart or tubercle. If they are born with a person, as they frequently are, they are called *nævi materni*, or marks from the mother; but if the tumour is large, so as to depend from the skin, like a fleshy mass, it is then called a *sarcoma*. See *SURGERY*.

EXCRETION, or SECRETION, in *Medicine*, a separation of some fluid, mixed with the blood, by means of the glands. Excretions, by which we mean those that evacuate superfluous and heterogeneous humours, purify the mass of blood: the humours which are generated in the blood are excreted by the glands, and are replaced by a sufficient quantity of aliment.

EXCRETORY, in *Anatomy*, a term applied to certain little ducts or vessels, destined for the reception of a fluid, secreted in certain glandules, and other viscera, for the excretion of it in the appropriated places.

EXCUBIÆ, in antiquity, the watches and guards kept in the day by the Roman soldiers. They are contradistinguished from the *vigiliæ* which were kept in the night. The *excubiæ* were placed either at the gates and intrenchments or in the camp; for the latter there was allowed a whole *manipulus* to attend before the *prætorium*, and four soldiers to the tent of every *tribune*. The *excubiæ* at the gates of the camp, and at the intrenchments, were properly called *stationes*. One company of foot and one troop of horse were assigned to each of the four gates every day. To desert their post, or abandon their corps of guards, was an unpardonable crime.

The *triarii*, as the most honourable order of soldiers, were excused from the ordinary watches; yet being placed opposite to the *equites*, they were obliged to have an eye over them.

LETTERS of EXCULPATION, in *Scots Law*, a writ or summons issued by authority of the court of judicatory, at the instance of a pannel, for citing witnesses to prove his defences, or his objections to any of the jury or witnesses cited against him.

EXCUSA^{TI} I, in church history, a term used to denote slaves, who flying to any church for sanctuary, were excused and pardoned by their masters; but these were obliged to take an oath to that purpose before they could have them again; and, if they broke the oath, they were punished and fined as persons guilty of perjury.

EXEAT, in church discipline, a Latin term, used for a permission which a bishop grants a priest to go

out of his diocese; or an abbot to a religious to go out of his monastery.

EXECRATION, in antiquity, a kind of punishment, consisting of direful curses and marks of infamy: such was that used against Philip king of Macedonia by the Athenians. A general assembly of the people being called, they made a decree, that all the statues and images of that king, and of all his ancestors, should be demolished, and their very name razed; that all the festivals, sacred rites, priests, and whatever else had been instituted in honour of him, should be profaned; that the very places where there had been any monument or inscription to his honour, should be detestable; that nothing should be set up, or dedicated in them, which could be done in clean places; and, lastly, that the priests, as often as they prayed for the Athenian people, allies, armies, and fleets, should as many times detest and execrate Philip, his children, kingdom, land and sea forces, and the whole race and name of the Macedonians.

At the taking and demolishing of cities, it was usual amongst the Jews, Greeks, and Romans, to pronounce curses upon, and load with direful execrations, the rebuilders of them.

EXECUTION, in a general sense, the act of accomplishing, finishing, or achieving any thing.

EXECUTION, in *Law*, the completing or finishing some act, as of judgment, deed, &c. and it usually signifies the obtaining possession of any thing recovered by judgment of law.

Sir Edward Coke observes, that there are two sorts of executions: the one final; and the other a quousque, that tends to an end. An execution final, is that which makes money of the defendant's goods; or extends to his lands and delivers them to the plaintiff, who accepts the same in satisfaction; and this is the end of the suit, and the whole that the king's writ requires to be done. The writ of execution with a quousque, though it tends to an end, yet is not final, as in the case *capias ad satisfac.* where the defendant's body is to be taken, in order that the plaintiff may be satisfied for his debt. -See *CAPIAS*.

Executions are either in personal, real, or mixed actions. In a personal action, the execution may be made three ways, viz. by the writs of *capias ad satisfaciendam*, against the body of the defendant; *fieri facias*, against his goods; or *elegit*, against his lands. See *FERI FACIAS* and *ELEGIT*.

In a real and mixed action, the execution is by writ of *habere facias sasinam*, and *habere possessionem**. Writs* See *Habe* of execution bind the property of goods only from the *bert.* time of delivery of the writ to the sheriff; but the land is bound from the day of the judgment obtained: and here the sale of any goods for valuable consideration, after a judgment, and before the execution awarded, will be good. It is otherwise as to lands, of which execution may be made, even on a purchase after the judgment, though the defendant sell such land before execution. Likewise, sheriffs may deliver in execution all the lands whereof others shall be seized in trust for him against whom execution is had on a judgment, &c.

When any judgment is signed, the execution may be taken out immediately thereon; but if it be not issued within a year and a day after, where there is no fault

Execra-
tion
||
Execution.

Execution. fault in the defendant, as in the case of an injunction, writ of error, &c. there must be a *scire facias*, to revive the judgment; though, if the plaintiff sues out any writ of execution within the year, he may continue it after the year is expired. After judgment against the defendant, in an action wherein special bail is given, the plaintiff is at liberty to have execution against such defendant, or against his bail: but this is understood where the defendant does not render himself, according to law, in safeguard of the bail: and execution may not regularly be sued forth against a bail, till a default is returned against the principal: also if the plaintiff takes the bail, he shall never take the principal. It is held that an execution may be executed after the death of the defendant: for his executor, being privy thereto, is liable, as well as the testator. The executor is an entire thing, so that he who begins must end it; therefore, a new sheriff may distrain an old one, to sell the goods seized on a distringas, and to bring the money into court.

EXECUTION, in criminal cases, the completion of human punishment. This follows judgment †; and must in all cases, capital as well as otherwise, be performed by the legal officer, the sheriff or his deputy; whose warrant for so doing was anciently by precept under the hand and seal of the judges, as it is still practised in the court of the lord high steward, upon the execution of a peer: though, in the court of the peers in parliament, it is done by writ from the king. Afterwards it was established, that in case of life, the judge may command execution to be done without any writ. And now the usage is, for the judge to sign the kalendar or list of all the prisoners names, with their separate judgments in the margin, which is left with the sheriff. As, for a capital felony, it is written opposite to the prisoner's name, "let him be hanged by the neck:" formerly, in the days of Latin and abbreviation, "*sus. per coll.*" for "*suspendatur per collum.*" And this is the only warrant that the sheriff has for so material an act as taking away the life of another. It may certainly afford matter of speculation, that in civil causes there should be such a variety of writs of execution to recover a trifling debt, issued in the king's name, and under the seal of the court, without which the sheriff cannot legally stir one step; and yet that the execution of a man, the most important and terrible task of any, should depend upon a marginal note.

The sheriff, upon receipt of his warrant, is to do execution within a convenient time; which in the country is also left at large. In London, indeed, a more solemn and becoming exactness is used, both as to the warrant of execution and the time of executing thereof: for the recorder, after reporting to the king in person the case of the several prisoners, and receiving his royal pleasure, that the law must take its course, issues his warrant to the sheriffs, directing them to do execution on the day and at the place assigned. And in the court of king's bench, if the prisoner be tried at the bar, or brought there by *habeas corpus*, a rule is made for his execution; either specifying the time and place, or leaving it to the discretion of the sheriff. And, throughout the kingdom, by statute 25 Geo. II. c. 37. it is enacted that, in case of murder, the judge shall in his sentence direct execution to be performed on the next day but one after sentence passed. But,

otherwise, the time and place of execution are by law Execution. no part of the judgment. It has been well observed, that it is of great importance that the punishment should follow the crime as early as possible; that the prospect of gratification or advantage, which tempts a man to commit the crime, should instantly awake the attendant idea of punishment. Delay of execution serves only to separate these ideas; and then the execution itself affects the minds of the spectators rather as a terrible sight, than as the necessary consequence of transgression.

The sheriff cannot alter the manner of the execution, by substituting one death for another, without being guilty of felony himself. It is held also by Sir Edward Coke and Sir Matthew Hale, that even the king cannot change the punishment of the law, by altering the hanging or burning into beheading; though, when beheading is part of the sentence, the king may remit the rest. And, notwithstanding some examples to the contrary, Sir Edward Coke strongly maintains, that *judicandum est legibus, non exemplis*. But others have thought, and more justly, that this prerogative, being founded in mercy, and immemorally exercised by the crown, is part of the common law. For hitherto, in every instance, all these exchanges have been for more merciful kinds of death; and how far this may also fall within the king's power of granting conditional pardons (*viz.* by remitting a severe kind of death, on condition that the criminal submits to a milder) is a matter that may bear consideration. It is observable, that when Lord Stafford was executed for the popish plot in the reign of King Charles II. the then sheriffs of London, having received the king's writ for beheading him, petitioned the house of lords, for a command or order from their lordships, how the said judgment should be executed: for, he being prosecuted by impeachment, they entertained a notion (which is said to have been countenanced by Lord Ruffel), that the king could not pardon any part of the sentence. The lords resolved, that the scruples of the sheriffs were unnecessary; and declared, that the king's writ ought to be obeyed. Disappointed of raising a flame in that assembly, they immediately signified to the house of commons by one of the members, that they were not satisfied as to the power of the said writ. That house took two days to consider of it; and then fully resolved, that the house was *content* that the sheriff do execute Lord Stafford by severing his head from his body. It is farther related, that when afterwards the same Lord Ruffel was condemned for high treason upon indictment, the king, while he remitted the ignominious part of the sentence, observed, "That his lordship would now find he was possessed of that prerogative, which in the case of Lord Stafford he had denied him." One can hardly determine (at this distance from those turbulent times), which most to disapprove of, the indecent and sanguinary zeal of the subject, or the cool and cruel sarcasm of the sovereign.

To conclude: It is clear, that if, upon judgment to be hanged by the neck till he is dead, the criminal be not thoroughly killed, but revives, the sheriff must hang him again. For the former hanging was no execution of the sentence; and, if a false tenderness were to be indulged in such cases, a multitude of collusions might ensue. Nay, even while abjurations were in force, such

† See Judgment.

Blackst. Comment.

Execution
||
Exemplar.

a criminal, so reviving, was not allowed to take sanctuary and abjure the realm; but his fleeing to sanctuary was held an escape in the officer.

EXECUTION, in the law of Scotland. See *LAW INDEX*.

EXECUTION, in the French music, is used to denote the manner of fingering, or of the performance of a song. "As to the manner of fingering, called in France *exécution*, no nation may, with any probability dispute it with the French. If the French, by their commerce with the Italians have gained a bolder composition, the Italians have made their advantage of the French, in learning of them a more polite, moving, and exquisite execution." St Evremond.

EXECUTIVE POWER. The supreme executive power of these kingdoms is vested by our laws in a single person, the king or queen for the time being. See the article KING.

The executive power, in this state, hath a right to a negative in parliament, i. e. to refuse assent to any acts offered; otherwise the two other branches of legislative power would, or might, become despotic.

EXECUTOR, a person nominated by a testator, to take care to see his will and testament executed or performed, and his effects disposed of according to the tenor of the will. See *LAW*.

EXECUTOR, in *Scots Law*, signifies either the person entitled to succeed to the moveable estate of one deceased, or who by law or special appointment is intrusted with the administration of it.

EXECUTORY, in *Law*, is where an estate in fee, that is, made by deed or fine, is to be executed afterwards by entry, livery, or writ. Lease for years, annuities, conditions, &c. are termed *inheritances executory*.

EXECUTRY, in *Scots Law*, is the moveable estate falling to the executor. Under executry, or moveables, is comprehended every thing that moves itself, or can be moved; such as corns, cattle, furniture, ready money, &c.

EXEDRÆ, in antiquity, denoted halls with many seats, where the philosophers, rhetoricians, and men of learning, met for discourse and disputation. The word occurs in ecclesiastical writers as a general name for such buildings as were distinct from the main body of the churches, and yet within the limits of the church taken in its largest sense. Among the *exedræ* the chief was the BAPTISTERY.

EXEGESIS, a discourse by way of explanation or comment upon any subject. In the Scotch universities, there is an exercise among the students in divinity, called an *exegetis*, in which a question is stated by the respondent, who is then opposed by two or three other students in their turns; during which time the professor moderates, and solves the difficulties which the respondent cannot overcome.

EXEGETES, (formed of *ἐξηγομαι*, "I explain,") among the Athenians, persons learned in the laws, whom the judges used to consult in capital causes.

EXEGETICA, in *Algebra*, the art of finding, either in numbers or lines, the roots of the equation of a problem, according as the problem is either numerical or geometrical.

EXEMPLAR, a model, or original, to be imitated, or copied. See *MODEL*.

EXEMPLAR also denotes the idea, or image, conceived

or formed in the mind of the artist, whereby he conducts his work. Such is the idea of Cæsar, which a painter has in his mind when he goes to make a picture of Cæsar.

EXEMPLIFICATION of *Letters Patent*, denotes an exemplar, or copy of letters patent, made from the enrolment thereof, and sealed with the great seal of England. Such exemplifications are as effectual to be showed or pleaded, as the letters patent themselves.

EXEMPTION, in *Law*, a privilege to be free from some service or appearance: thus, barons and peers of the realm are, on account of their dignity, exempted from being sworn upon inquests; and knights, clergymen, and others, from appearing at the sheriff's turn. Persons of 70 years of age, apothecaries, &c. are also by law exempted from serving on juries; and justices of the peace, attorneys, &c. from parish offices.

EXERCISE, among physicians, such an agitation of the body as produces salutary effects in the animal economy.

Exercise may be said to be either active or passive. The active is walking, hunting, dancing, playing at bowls, and the like; as also speaking, and other labour of the body and mind. The passive is riding in a coach, on horseback, or in any other manner. Exercise may be continued to a beginning of weariness, and ought to be used before dinner in a pure light air; for which reason, journeys, and going into the country, contribute greatly to preserve and re-establish health.

Exercise increases the circulation of the blood, attenuates and divides the fluids, and promotes a regular perspiration, as well as a due secretion of all the humours; for it accelerates the animal spirits, and facilitates their distribution into all the fibres of the body, strengthens the parts, creates an appetite, and helps digestion. Whence it arises, that those who accustom themselves to exercise are generally very robust, and seldom subject to diseases.

Boerhaave recommends bodily exercise in diseases of a weak and lax fibre. By riding on horseback, says his commentator, the pendulous viscera of the abdomen are shaken every moment, and gently rubbed as it were one against another, while in the mean time the pure air acts on the lungs with greater force. But it is to be observed that a weak man should not ride with a full stomach, but either before dinner, or after the digestion is nearly finished; for when the stomach is distended, weak people do not bear these concussions of the horse without difficulty; but when the *primæ viæ* are nearly empty, the remaining feces are discharged by this concussion. Sailing in a ship is also an exercise of great use to weak people. If the vessel moves with an even motion, by increasing perspiration it usually excites a wonderful alacrity, creates an appetite, and promotes digestion. These exercises are more especially serviceable to weak people; but, in order to strengthen the body by muscular motion, running and bodily exercises are to be used. In these we should begin with the most gentle, such as walking, and increase it by degrees till we come to running. Those exercises of the body are more especially serviceable which give delight to the mind at the same time, as tennis, fencing, &c.; for which reason, the wisdom of antiquity appointed rewards for those who excelled in these gymnastic exercises.

Exemplification
||
Exercise.

Exercise. Exercises, that by this means the bodies of their youth might be hardened for warlike toils.

As nothing is more conducive to health than moderate exercise, so violent exercise dissipates the spirits, weakens the body, destroys the elasticity of the fibres, and exhausts the fluid parts of the blood. No wonder, then, that acute and mortal fevers often arise from too violent exercise of the body; for the motion of the venous blood towards the heart being quickened by the contraction of the muscles, and the veins being thus depleted, the arteries more easily propel their contained humours through the smallest extremities into the now less resisting veins; and therefore the velocity of the circulation will be increased through all the vessels. But this cannot be performed without applying the humours oftener, or in a greater quantity, to the secretory organs in the same time, whence the more fluid parts of the blood will be dissipated, and what remains will be inspissated; and by the greater action of the vessels upon their contained fluids, and of the reacting fluids upon the vessels, the blood acquires an inflammatory density. Add to this, that by the violent attrition of the solids and fluids, together with the heat thence arising, all the humours will incline to a greater acrimony, and the salts and oils of the blood will become more acrid and volatile. Hence, says Boerhaave, those fevers which arise from too much exercise or motion, are cured by rest of body and mind, with such allays and medicines as moisten, dilute, and soften or allay acrimony.

The exercise of a soldier in camp, considered as conducive to health, Dr Pringle distinguishes into three heads: the first relating to his duty, the second to his living more commodiously, and the third to his diversions. The first, consisting chiefly in the exercise of his arms, will be no less the means of preserving health than of making him expert in his duty: and frequent returns of this, early, and before the sun grows hot, will be made more advantageous than repeating it seldom, and staying out long at a time; for a camp affording little convenience for refreshment, all unnecessary fatigue is to be avoided. As to the second article, cutting boughs for shading the tents, making trenches round them for carrying off the water, airing the straw, cleaning their clothes and accoutrements, and assisting in the business of the mess, ought to be no disagreeable exercise to the men for some part of the day. Lastly, As to diversions, the men must be encouraged to them either by the example of their officers, or by small premiums to those who shall excel in any kind of sports as shall be judged most conducive to health: but herein great caution is necessary, not to allow them to fatigue themselves too much, especially in hot weather or sickly times; but above all, that their clothes be kept dry, wet clothes being the most frequent causes of camp diseases.

EXERCISE, in military affairs, is the ranging a body of soldiers in form of battle, and making them perform the several motions and military evolutions with different management of their arms, in order to make them expert therein. See also *WORDS of Command*.

EXERCISE, in the royal navy, is the preparatory practice of managing the artillery and small arms, in order to make the ship's crew perfectly skilled therein,

so as to direct its execution successfully in the time of Exercise. battle.

The exercise of the great guns was formerly very complicated, and abounding with superfluities, in our navy, as well as all others. The following method was, it is said, successfully introduced by an officer of distinguished abilities.

- 1st, Silence.
- 2d, Cast loose your guns.
- 3d, Level your guns.
- 4th, Take out your tompons.
- 5th, Run out your guns.
- 6th, Prime.
- 7th, Point your guns.
- 8th, Fire.
- 9th, Sponge your guns.
- 10th, Load with cartridge.
- 11th, Shot your guns.
- 12th, Put in your tompons.
- 13th, House your guns.
- 14th, Secure your guns.

Upon beat to arms (every body having immediately repaired to their quarters) the midshipman commanding a number of guns, is to see that they are not without every necessary article, as (at every gun) a sponge, powder horn, with its priming wires, and a sufficient quantity of powder, crow, handspike, bed, quoin, train tackle, &c. sending without delay for a supply of any thing that may be amissing; and for the greater certainty of not overlooking any deficiency, he is to give strict orders to each captain under him, to make the like examination at his respective gun, and to take care that every requisite is in a serviceable condition, which he is to report accordingly. And (besides the other advantages of this regulation) for the still more certain and speedy account being taken upon these occasions, the midshipman is to give each man his charge at quarters (as expressed in the form of the monthly report), who is to search for his particular implements, and, not finding them, is immediately to acquaint his captain, that, upon his report to the midshipman, they may be replaced.

The man who takes care of the powder is to place himself on the opposite side of the deck from that where we engage, except when fighting both sides at once, when he is to be amid ships. He is not to suffer any other man to take a cartridge from him but he who is appointed to serve the gun with that article, either in time of a real engagement or at exercise.

Lanterns are not to be brought to quarters in the night, until the midshipman gives his orders for so doing to the person he charges with that article. Every thing being in its place, and not the least lumber in the way of the guns, the exercise begins with,

1. "Silence." At this word every one is to observe a silent attention to the officers.
2. "Cast loose your guns." The muzzle lashing is to be taken off from the guns, and (being coiled up in a small compass) is to be made fast to the eye-bolt above the port. The lashing tackles at the same time to be cast loose, and middle of the breeching seized to the thimble of the pomillion. The sponge to be taken down, and, with the crow, handspike, &c. laid upon the deck by the gun. N. B. When prepared for engaging

Exercise.

gaging an enemy, the breeching within the clinch of the breeching is to be cut, that the gun may come sufficiently within board for loading, and that the force of the recoil may be more spent before it acts upon the breeching.

3. "Level your guns." The breech of your metal is to be raised so as to admit the foot of the bed's being placed upon the axletree of the carriage, with the quoin upon the bed, both their ends being even one with the other. N. B. When levelled for firing, the bed is to be lashed to the bolt which supports the inner end of it, that it may not be thrown out of its place by the violence of the gun's motion when hot with frequent discharges.

4. "Take out your tompions." The tompion is to be taken out of the gun's mouth, and left hanging by its laniard.

5. "Run out your guns." With the tackles hooked to the upper bolts of the carriage, the gun is to be bowled out as close as possible, without the assistance of crows or handspikes; taking care at the same time to keep the breeching clear of the trucks, by hauling it through the rings; it is then to be bent so as to run clear when the gun is fired. When the gun is out, the tacklefalls are to be laid alongside the carriages in neat fakes, that, when the gun by recoiling overhauls them, they may not be subject to get foul, as they would if in a common coil.

6. "Prime." If the cartridge is to be pierced with the priming wire, and the vent filled with powder, the pan also is to be filled; and the flat space having a score through it at the end of the pan, is to be covered, and this part of the priming is to be bruised with the round part of the horn. The apron is to be laid over, and the horn hung up out of danger from the flash of the priming.

7. "Point your guns." At this command the gun is, in the first place, to be elevated to the height of the object, by means of the side sights; and then the person pointing is to direct his fire by the upper sight, having a crow on one side and a handspike on the other, to heave the gun by his direction till he catches the object.

N. B. The men who heave the gun for pointing are to stand between the ship's side and their crows or handspikes, to escape the injury they might otherwise receive from their being struck against them, or splintered by a shot; and the man who attends the captain with a match is to bring it at the word, "Point your guns," and kneeling upon one knee opposite the train-truck of the carriage, and at such a distance as to be able to touch the priming, is to turn his head from the gun, and keep blowing gently upon the lighted match to keep it clear from ashes. And as the missing of an enemy in action, by neglect or want of coolness, is most inexcusable, it is particularly recommended to have the people thoroughly instructed in pointing well, and taught to know the ill consequences of not taking proper means to hit their mark; wherefore they should be made to elevate their guns to the utmost nicety, and then to point with the same exactness. Having caught the object through the upper sight, at the word,

8. "Fire," The match is instantly to be put to the bruised part of the priming; and when the gun is dis-

VOL. VIII. Part I.

charged, the vent is to be closed, in order to smother any spark of fire that may remain in the chamber of the gun; and the man who sponges is immediately to place himself by the muzzle of the gun in readiness; when, at the next word,

9. "Sponge your guns," The sponge is to be rammed down to the bottom of the chamber, and then twisted round, to extinguish effectually any remains of fire; and, when drawn out, to be struck against the outside of the muzzle, to shake off any sparks or scraps of the cartridge that may have come out with it; and next, its end is to be shifted ready for loading; and while this is doing, the man appointed to provide a cartridge is to go to the box, and by the time the sponge is out of the gun, he is to have it ready; and at the word,

10. "Load with cartridge," The cartridge (with the bottom-end first, seam downwards, and a wad after it) is to be put into the gun, and thrust a little way within the mouth, when the rammer is to be entered: the cartridge is then to be forcibly rammed down; and the captain at the same time is to keep his priming-wire in the vent, and, feeling the cartridge, is to give the word *home*, when the rammer is to be drawn, and not before. While this is doing, the man appointed to provide a shot is to provide one (or two, according to the order at that time) ready at the muzzle, with a wad likewise; and when the rammer is drawn, at the word,

11. "Shot your guns," The shot and wad upon it are to be put into the gun, and thrust a little way down, when the rammer is to be entered as before. The shot and wad are to be rammed down to the cartridge, and there have a couple of forcible strokes; when the rammer is to be drawn, and laid out of the way of the guns and tackles, if the exercise or action is continued; but if it is over, the sponge is to be secured in the place it is at all times kept in.

12. "Put in your tompions." The tompions to be put into the muzzle of the cannon.

13. "Houfe your guns." The seizing is to be put on again upon the clinched end of the breeching, leaving it no slacker than to admit of the gun's being housed with ease. The quoin is to be taken from under the breech of the gun, and the bed, still resting upon the bolt within the carriage, thrust under, till the foot of it falls off the axletree, leaving it to rest upon the end which projects out from the foot. The metal is to be let down upon this. The gun is to be placed exactly square; and the muzzle is to be close to the wood, in its proper place for passing the muzzle-lashings.

14. "Secure your guns." The muzzle-lashings must first be made secure, and then with one tackle (having all its parts equally taught with the breeching the gun is to be lashed. The other tackle is to be bowled taught, and by itself made fast, that it may be ready to cast off for lashing a second breeching. N. B. Care must be taken to hook the first tackle to the upper bolt of the carriage, that it may not otherwise obstruct the reeving of the second breeching, and to give the greater length to the end part of the fall. No pains must be spared in bowling the lashing very taught, that the gun may have the least play that is possible, as their being loose may be productive of very

Exercise.

Exercise, dangerous consequences. The quoin, crow, and hand-spike are to be put under the gun, the powder-horn hung up in its place, &c.

Being engaged at any time when there is a large swell, a rough sea or in squally weather, &c. as the ship may be liable to be suddenly much heeled, the port-tackle fall is to be kept clear, and (whenever the working of the gun will admit of it) the man charged with that office is to keep it in his hand; at the same time the muzzle-lashing is to be kept fast to the ring of the port, and being hauled taught, is to be fastened to the eye-bolt over the port-hole, so as to be out of the gun's way in firing, in order to haul it in at any time of danger.

This precaution is not to be omitted, when engaging to the windward, any more than when to the leeward, those situations being very subject to alter at too short a warning.

A train tackle is always to be made use of with the lee guns; and the man stationed to attend it is to be very careful in preventing the guns running out at an improper time.

EXERCISE, may also be applied with propriety to the forming our fleets into orders of sailing, lines of battle, &c. an art which the French have termed *evolutions*, or *tactiques*. In this sense exercise may be defined, the execution of the movements which the different orders and disposition of fleets occasionally require, and which the several ships are directed to perform by means of signals. See TACTICS.

EXERCISES, are also understood of what young gentlemen learn in the academies and riding schools, such as fencing, drawing, riding the great horse, &c.

How useful, how agreeable soever, study may be to the mind, it is very far from being equally salutary to the body. Every one observes, that the Creator has formed an intimate connexion between the body and the mind; a perpetual action and reaction, by which the body instantly feels the disorders of the mind, and the mind those of the body. The delicate springs of our frail machines lose their activity and become enervated, and the vessels are choked by obstructions, when we totally desist from exercise, and the consequences necessarily affect the brain; a more studious and sedentary life is therefore equally prejudicial to the body and the mind. The limbs likewise become stiff; we contract an awkward constrained manner; a certain disgusting air attends all our actions, and we are very near being as disagreeable to ourselves as to others. An inclination to study is highly commendable; but it ought not, however, to inspire us with an aversion to society. The natural lot of man is to live among his fellows: and whatever may be the condition of our birth, or our situation in life, there are a thousand occasions where a man must naturally desire to render himself agreeable; to be active and adroit; to dance with a grace; to command the fiery steed; to defend himself against a brutal enemy; to preserve his life by dexterity; as by leaping, swimming, &c. Many rational causes have therefore given rise to the practice of particular exercises; and the most sagacious and benevolent legislators have instituted, in their academies and universities, proper methods of enabling youth, who devote themselves to study, to become expert also in laudable exercises.

EXERCITOR, in *Scots Law*, he who employs a ship in trade, whether he be owner, or only freights her from the owner.

EXERGESIA. See ORATORY, N^o 90.

EXERGUM, among antiquarians, a little space around or without the figures of a medal, left for the inscription, cipher, device, date, &c.

EXETER, the capital city of Devonshire, situated on the river Ex, ten miles north of the British channel: W. Long. 3. 40. N. Lat. 50. 44. Anciently the name of this city was *Isex*, and *Ixia Dumnoniorum*. The present name is a contraction of *Excester*, that is, a city upon the Ex. It is large, populous, and wealthy, with gates, walls, and suburbs: the circumference of the whole is about three miles. It is the see of a bishop, transferred hither from Crediton, by Edward the Confessor; and is one of the principal cities in the kingdom, for its buildings, wealth, and number of its inhabitants. It had six gates, besides many turrets, several of which are now pulled down. It had formerly so many convents, that it was called *Monk-town*, till King Athelstan changed its name to Exeter, about the year 940; at which time he also fortified the city (which had before been only enclosed with a ditch and a fence of timber) with circular walls, embattlements, towers, and turrets of squared-stone, encircling the whole, except the western side, with a deep moat. Besides chapels and five large meeting houses, there are now 15 churches within the walls, and four without. St Peter's, the cathedral, is a magnificent pile; though little now remains of the ancient fabric of the church, except that part which is called *Our Lady's Chapel*. It has a ring of 12 bells, reckoned the largest ring of the largest bells in England; as is also its organ, whose largest pipes are 15 inches in diameter. In 1763 the cathedral was repaired, beautified, and new paved; when, in removing the old pavement, was found the leaden coffin of Bishop Bitton, who died in 1307; the top of which, being decayed, afforded an opportunity of viewing the skeleton lying in its proper form: near the bones of the finger was found a sapphire ring set in gold; the stone considerably large, but of no great value, on account of several flaws in it. Near this stood a small neat chalice and patten of silver gilt, but the damp had destroyed the greatest part of the gilding. In the centre of the patten was engraved a hand, with the two fore-fingers extended in the attitude of benediction. The top of the crozier was also found, but totally decayed. A most beautiful modern painted glass window has been lately erected at the western end of the cathedral, the eastern end having before a remarkable fine antique one. In the other windows there is much fine ancient painted glass. The altar is remarkable for its beautiful design and execution. On the left hand side of it there yet exists the seat where Edward the Confessor and his queen sat and installed Leofricus, his chancellor, the first bishop of Exeter; and in the fourth cross aisle is the monument of the same Leofricus, who died 1073, which at the time of his interment was a part of the churchyard, but by the enlarging of the church by his successors, became nearly the middle of the building. The grand western end of the church is most magnificently adorned with the statues of the patriarchs, &c. The chapter house was built in 1439.

The

Exercitor
||
Exeter.

Exeter.

The beautiful throne for the bishop was constructed about 1466, and is said to be the grandest of the kind in Britain. The great north tower was completed in 1485, which contains a bell, that weighs 12,500 pounds; and exceeds the great Tom of Lincoln by 2,500 pounds. This city has had divers charters granted, or confirmed by most of our kings; but it was made a mayor town in the reign of King John, and a county of itself by King Henry VIII. It is governed by a mayor, 24 aldermen, four bailiffs, a recorder, chamberlain, sheriff, town-clerk, &c. They have a sword-bearer, and four stewards, four serjeants at mace wearing gowns, and staff-bearers in liveries with silver badges. It had anciently a mint; and in the reigns of King William III. and Queen Anne, many pieces of silver money were coined here, which have the letter E under the bust. Here are 12 or 13 incorporate city companies. All pleas and civil causes are tried by the mayor, recorder, aldermen, and common council; but criminal causes, and those relating to the peace, are determined by eight aldermen, who are justices of the peace. Here are four principal streets, all entering in the middle of the city, which is therefore called *Carfox*, from the old Norman word *Quatre voix*, i. e. the four ways. Near it is a conduit, lately removed from the centre to the side of the principal street, which was first erected by William Duke, mayor of the city, in the reign of Edward IV. and there are others well supplied with water brought in pipes from the neighbourhood. There is an old castle in the north-east part of the city, called *Rougemont*, from the red soil it stands on; from thence there is a pleasant prospect from the walls. It is supposed to have been built by the West Saxon kings, and that they resided here, as did afterwards the earls and dukes of Cornwall. This castle was remarkably strong both by nature and art. The gate which originally led into it, was walled up by order of William the Conqueror, in token of his having reduced it to his obedience after a very obstinate resistance; and close by it an inferior gate was made in the wall in which state they both remain. The outward stone facing is kept in tolerable repair; but the inside being but earth, is gradually crumbled down. Here yet remains the ancient chapel, built in 1260, and kept in good repair, where prayers are read, and a sermon preached in sessions weeks. The city itself is healthy, and pleasantly situated on the sides of a hill, having other hills to its N. W. and S. by which it is sheltered from the force of storms. The bank which sustained the ditch that in a great part surrounded the castle, is planted and gravelled, and accommodated with seats, it being the place of resort for walking for the inhabitants; and the ditch between it and the castle being filled up, is now thickly planted with elms, which form a delightful grove. The old palace is now entirely demolished, and an elegant sessions house erected, where the assizes, quarter-sessions, and county courts are held. In the city and suburbs are prisons both for debtors and malefactors; a workhouse, alms houses, and charity schools; an hospital for the sick and lame poor of the city and county, upon the model of the infirmaries of London and Westminster; and two free grammar-schools. It has markets on Wednesdays and Fridays; and four fairs in the year. Great trade is carried on here in serges, perpetuanas,

Exeter.

long ells, and other woollen goods, in which it is computed that at least 600,000l. a year is traded for; yet no markets were erected here for wool, yarn, and kerseys, till the 30th of Henry VIII. Before that time the merchants drove a considerable trade to Spain and France: they were incorporated in the reign of Queen Mary I. by the name of "The Governor, Consuls, and Society of Merchant-adventurers, trading to France." Here is also a weekly serge market, the greatest in England, next to the Brigg market at Leeds in Yorkshire. It is said that some weeks as many serges have been sold here as amount to 80,000l. or 100,000l.; for besides the vast quantities of their woollen goods shipped for Portugal, Spain, and Italy, the Dutch give large commissions for buying up serges, perpetuanas, &c. for Holland and Germany. It is particularly remarked of this city, that it is almost as full of gentry as of tradesmen; and that more of its mayors, and bailiffs have descended from, or given rise to good families, than in any other city of its bigness in the kingdom: for the great trade and flourishing state of this city tempted gentlemen to settle their sons in it, contrary to the practice of many of the inland as well as northern counties, where, according to the vain and ruinous notion of the Normans, trade was despised by the gentry, as fit for only mechanics and the vulgar. This city was under the jurisdiction of the Romans, whose coins have been frequently dug up in and about it. After they left England, the Saxons drove the Britons out of it into Cornwall, and encompassed it with a ditch, besides bulwarks. The Danes attacked and spoiled it in 875; and afterwards in revenge of the general massacre of the Danes by the English, Sweyn one of their kings, came hither with a great force, put the men to the sword, ravished the women, massacred the children, burnt the city, and defaced the walls. A long time after this, just as it was reviving, William the Conqueror besieged and took it; and it was again besieged in the reigns of King Stephen and Edward IV. In the reign of Henry VII. it was again besieged by Perkin Warbeck, and battered furiously: but the citizens forced him to raise the siege; which so pleased the king, that he came hither, and presented a cap of maintenance to the city, and gave the very sword from his side to be borne always before the mayor. In the reign of Edward VI. in July 1544, it was smartly cannonaded by the rebels of Cornwall and Devon, who almost starved it by breaking down its bridges, cutting off its water, and stopping up all passages; but it held out till the lord John Russell came with a force and raised the siege on the 6th of August, which was then appointed as an anniversary day of thanksgiving by the city, and is still observed as such. King Charles I.'s queen, to whom this city gave shelter in the civil wars, was here delivered of Henrietta, afterwards duchess of Orleans; whose picture is in its guildhall, as are also General Monk's and George I.'s, &c. In the south-east quarter of the city was a house called *Bedford house*, wherein the above queen was delivered of the princess. This having lately been taken down, an elegant circus is built on the spot, with a theatre adjoining it; and for the convenience of the inhabitants, a passage has been made through the town wall to Southern Hay, on which green stands the county hospital, already spoken of, besides a considerable number of new buildings. There

Exeter
||
Exhaustions

are remains of several ancient structures, which are daily giving way to modern erections; among the rest, an old building, said to have been a palace of King Athelstan. The guildhall is a spacious and convenient building, whose front or portico projects a great way into the street, and was first erected in 1330, to which its present front was rebuilt in 1593, and repaired in 1720. An arm of the sea formerly flowed nearly up to the city's wall, till 1316, when Hugh Courtenay earl of Devon, in revenge for an affront, ruined the navigation, by constructing weirs and dams in the river; but to remedy it, in 1539, an act of parliament passed for making a navigable canal, for the better conveyance of goods in barges to and from the city to Topsham. This was carried into execution in 1581, but not completed till 1673; nor was it after all found sufficient, till the present haven was constructed in 1697, when it was rendered capable of bringing ships of 150 tons quite to the quay, constructed near the walls of the city. In short, Exeter, by a constant adherence to its motto, *Semper fidelis*, has been applauded by all historians for its inviolable fidelity to its sovereigns, whether they held their crown by hereditary or parliamentary right. The city sends two members to parliament; and gives title of earl to the Cecils.—The see of Exeter was once one of the most wealthy in the kingdom; but its revenues were most shamefully wasted by Bishop Voysey, who alienated its lands. What little he left was so much encumbered, that the see has never been able to recover its former grandeur; and so small are its present revenues, that it has been found necessary for the bishop to hold some other preferment for the better support of his dignity and rank. This see hath yielded to the nation three lord chancellors, two lord treasurers, one lord president of Wales, and one chancellor to the university of Oxford. The diocese contains the entire counties of Devonshire and Cornwall, wherein are 604 parishes, whereof 239 are impropriate. It hath four archdeacons, viz. of Cornwall, Exeter, Barnstable, and Totnes. The diocese was formerly valued in the king's books at 1556l. 14s. 6d.; but, since Bishop Voysey's time, it is lowered to 500l. and is computed to be worth annually 2700l. The clergy's tenth is 1200l. 15s. 2½d. To the cathedral belong a bishop, a dean, four archdeacons, a chancellor, a treasurer, a chantor, 24 prebendaries, and other inferior officers and servants.

EXFOLIATION, a term used by surgeons for the scaling of a bone, or its rising and separating into thin laminae or scales.

EXHALATION, a general term for all effluvia or steams raised from the surface of the earth in form of vapour.

EXHAUSTIONS, in *Mathematics*. Method of exhaustions, is a way of proving the equality of two magnitudes, by a *reductio ad absurdum*; showing, that if one be supposed either greater or less than the other, there will arise a contradiction.

The method of exhaustions was of frequent use among the ancient mathematicians; as Euclid, Archimedes, &c. It is founded on what Euclid says in his tenth book; viz. that those quantities whose difference is less than any assignable quantity, are equal; for if they were unequal, be the difference never so small, yet it may be so multiplied, as to become greater than either

of them; if not so, then it is really nothing. This he assumes in the proof of Prob. I. book x. which imports, that if, from the greater of two quantities, you take more than its half, and from the remainder more than its half, and so continually, there will, at length, remain a quantity less than either of those proposed. On this foundation it is demonstrated, that if a regular polygon of infinite sides be inscribed in, or circumscribed about, a circle; the space, which is the difference between the circle and the polygon, will, by degrees, be quite exhausted, and the circle become equal to the polygon.

EXHEREDATION, in the civil law, with us ordinarily called *disinheritance*, is the father's excluding his sons from inheriting his estate.

There are 14 causes of exheredation expressed in Justinian's Novellæ; without some one of which causes, he decrees the exheredation null, and the testament inofficious, as the civilians call it. Indeed, by the ancient Roman law, the father might pronounce exheredation without any cause; but the rigour of this law was restrained and moderated by Justinian.

EXHIBIT, in *Law*, is where a deed, or other writing, being produced in a chancery suit to be proved by witnesses, the examiner, or commissioner appointed for the examination of any such, certifies on the back of the deed or writing, that the same was shown to the witness at the time of his examination, and by him sworn to.

EXHIBITION, in *Law*, a producing, or showing, of titles, authorities, and other proofs, of a matter in contest.

Anciently they used the phrase, *exhibition* of a tragedy, comedy, or the like; but now we say *representation* in lieu thereof.

EXHIBITION, in our old writers, is used for an allowance of meat and drink, such as was customary among the religious appropriators of churches, who usually made it to the depending vicar. The benefactions settled for the maintaining of scholars in the universities, not depending on the foundation, are also called *exhibitions*.

EXHORTATION, in *Rhetoric*, differs only from *suaſion*, in that the latter principally endeavours to convince the understanding, and the former to work on the affections.

EXHUMATION, (of *ex* "out of," and *humus* "ground"), the act of digging up a body interred in holy ground, by the authority of the judge. In France, the exhumation of a dead body is ordered, upon proof that he was killed in a duel. By the French laws, a parson has a right to demand the exhumation of the body of one of his parishioners, when interred out of the parish without his consent.

EXIGENCE, or **EXIGENCY**, that which a thing requires, or which is expedient and suitable thereto.

EXIGENT, in *Law*, a writ which lies where the defendant in a personal action cannot be found, nor any effects of his within the county, by which he may be attached or distrained.

EXIGENTERS, four officers in the court of common pleas, who make all exigents and proclamations, in all actions where process of outlawry lies. Writs of superſedeas, as well as the prothonotaries, upon exigents, are likewise drawn up in their office.

EXILE.

Exheredation
||
Exigenters.

Exile
||
Exorcism.

EXILE. See BANISHMENT.

Among the Romans, the word *exilium* properly signified an interdiction or exclusion from water and fire; the necessary consequence of which was, that the interdicted person must betake himself into some other country, since there was no living without fire and water.—Thus Cicero, *ad Herenn.* observes, that the form of the sentence did not express *exilium*, but only *aque et ignis interdictio*. The same author remarks, that exile was not properly a punishment, but a voluntarily flying or avoiding the punishment decreed: *Exilium non esse supplicium, sed per fugium, partusque supplicii*. He adds, that there was no crime among the Romans, as among other nations, punished with exile; but exile was a resource to which people flew voluntarily, in order to avoid chains, ignominy, starving, &c.

The Athenians frequently sent their generals and great men into exile, out of envy of their merits, or distrust of their too great authority. See OSTRACISM.

EXISTENCE, that whereby any thing has an actual essence, or is said to *be*. See the article METAPHYSICS.

EXIT, properly expresses the departure of a player from off the stage, when he has acted his part. The word is also used in a figurative sense, to express any kind of departure, even death.

EXITERIA, in antiquity, oblations or prayers to any of the gods for a prosperous expedition or journey. There were also feasts under this denomination, which were celebrated by the Greeks with sacrifices and prayers, when their generals undertook expeditions against an enemy.

EXOCOETUS, the FLYING FISH, a genus of fishes belonging to the order of abdominales. See ICHTHOLOGY Index.

EXODIARY, in the ancient Roman tragedy, was the person who, after the drama or play was ended, sung the EXODIUM.

EXODIUM, in the ancient Greek drama, one of the four parts or divisions of tragedy, being so much of the piece as included the catastrophe and unravelling of the plot, and answering nearly to our fourth and fifth acts.

EXODIUM, among the Romans, consisted of certain humorous verses rehearsed by the exodiary at the end of the *Fabulæ Atellanæ*.

EXODIUM, in the Septuagint, signifies the end or conclusion of a feast. Particularly it is used for the eighth day of the feast of tabernacles, which, it is said, had a special view to the commemoration of the *exodus* or departure out of Egypt.

EXODUS, a canonical book of the Old Testament; being the second of the Pentateuch, or five books of Moses.

It is so called from the Greek *εξοδος*, the "going out" or departure of the children of Israel from the land of Egypt; the history of which is delivered in this book, together with the many miracles wrought on that occasion.

EXOMPHALUS, in Surgery, called also *omphalocele*, and *hernia umbilicalis*, is a preternatural tumor of the abdomen, at the navel, from a rupture or distension of the parts which invest that cavity.

EXORCISM, the expelling of devils from persons possessed, by means of conjurations and prayers. The

Jews made great pretences to this power. Josephus tells several wonderful tales of the great success of several exorcists. One Eleazer, a Jew, cured many dæmoniacs, he says, by means of a root set in a ring. This root, with the ring, was held under the patient's nose, and the devil was forthwith evacuated. The most part of conjurors of this class were impostors, each pretending to a secret nostrum or charm which was an overmatch for the devil. Our Saviour communicated to his disciples a real power over dæmons, or perhaps over the diseases said to be occasioned by dæmons. See DÆMONIAC.

Exorcism makes a considerable part of the superstition of the church of Rome, the rituals of which forbid the exorcising any person without the bishop's leave. The ceremony is performed at the lower end of the church, towards the door. The exorcist first signs the possessed person with the sign of the cross, makes him kneel, and sprinkles him with holy water. Then follow the litanies, psalms, and prayer; after which the exorcist asks the devil his name, and adjures him by the mysteries of the Christian religion not to afflict the person any more: then, laying his right hand on the dæmoniac's head, he repeats the form of exorcism, which is this: "I exorcise thee, unclean spirit, in the name of Jesus Christ: tremble, O Satan! thou enemy of the faith, thou foe of mankind, who hast brought death into the world; who hast deprived men of life, and hast rebelled against justice: thou seducer of mankind, thou root of evil, thou source of avarice, discord, and envy." The Romanists likewise exorcise houses and other places, supposed to be haunted by unclean spirits; and the ceremony is much the same with that for persons possessed.

EXORCISTS, in church history, an order of men, in the ancient church, whose employment it was to exorcise or cast out devils. See the preceding article.

EXORDIUM, in Oratory, is the preamble or beginning, serving to prepare the audience for the rest of the discourse.

Exordiums are of two kinds; either just and formal, or vehement and abrupt. The last are more suitable on occasions of extraordinary joy, indignation, or the like. See ORATORY, N^o 26.

EXOSTOSIS (from *εξ* out, and *οστος*, a bone), in Anatomy, an acute eminence or excrescence, pushing preternaturally above the bone.

EXOTERIC and **ESOTERIC**, are terms denoting *external* and *internal*, and applied to the double doctrine of the ancient philosophers: the one was public or *exoteric*; the other secret, or *esoteric*. The first was that which they openly professed and taught to the world; the latter was confined to a small number of chosen disciples. This method was derived originally from the Egyptians; who, according to the united testimony of Herodotus, Diodorus Siculus, Strabo, Plutarch, &c. had a twofold philosophy, one secret and sacred, another public and common. The same practice also obtained among the Persian Magi, the Druids of the Gauls, and the Brachmans of India. The Egyptian priests, with whom it originated, sustained the character of judges and magistrates, and probably introduced this distinction with a view to the public welfare, and to serve the purposes of legislation and government. Clement of Alexandria informs us, that

Exorcists
||
Exoteric.

Exotic
||
Expecta-
tion.

that they communicated their mysteries principally to those who were concerned in the administration of the state; and Plutarch confirms the same declaration. However, others have supposed that they invented the fables of their gods and heroes, and the other external ceremonies of their religion, to disguise and conceal natural and moral truths; but whatever was the motive of their practice, it was certainly applied to political purposes.

EXOTIC, a term properly signifying *foreign* or *extraneous*, i. e. brought from a remote or strange country. In which sense we sometimes say *exotic* or *barbarous terms* or *words*, &c. The word is derived from the Greek *εξω, εξωθεν*, *extra*, "without, on the outside."

EXOTIC, is chiefly applied to plants which are natives of foreign countries, particularly those brought from the East and West Indies, and which do not naturally grow in Europe.

The generality of exotics, or exotic plants, do not thrive in England without some peculiar care and culture: they require the warmth of their own climates; whence the use of hot beds, glass frames, green houses, &c. See GARDENING *Index*.

EXPANSION, among metaphysicians, denotes the idea we have of lasting distance, all whose parts exist together.

EXPANSION, in *Physics*, the enlargement or increase of bulk in bodies, chiefly by means of heat. This is one of the most general effects of that subtle principle, being common to all bodies whatever, whether solid or fluid. In some few cases, indeed, bodies seem to expand as they grow cold, as water in the act of freezing: but this is found to be owing to a new arrangement of the particles, or to crystallization; and is not at all a regular and gradual expansion like that of metals, or any other solid or fluid substance by means of heat. In certain metals also, an expansion takes place when they pass from a fluid to a solid state: but this too is not to be accounted any proper effect of cold, but of the arrangement of the parts of the metal in a peculiar manner; and is therefore to be ascribed to a kind of crystallization.

The expansion of bodies by heat is very various, and in solids does not seem to be guided by any certain rule. In the 48th volume of the *Phil. Trans.* Mr Smeaton has given a table of the expansions of many different substances. See CHEMISTRY *Index*.

EXPECTANCY, *ESTATES IN*, are of two sorts; one created by act of the parties, called a *remainder*; the other, by act of law, called *reversion*.

EXPECTATION, in the doctrine of chances, is applied to any contingent event, and is capable of being reduced to the rules of computation. Thus a sum of money in expectation when a particular event happens, has a determinate value before that event happens; so that if a person is to receive any sum, e. gr. 100l. when an event takes place which has an equal probability of happening and failing, the value of the expectation is half that sum or 50l.; and in all cases the expectation of obtaining any sum is estimated by multiplying the value of the sum expected by the fraction which represents the probability of obtaining it. The expectation of a person who has three chances in five of obtaining 100l. is equal to $\frac{3}{5} \times 100$ or 60l. and the

probability of obtaining 100l. in this case is equal to $\frac{60}{100} = \frac{3}{5}$.

EXPECTATION of *Life*, signifies, in the doctrine of life annuities, that share or number of the years of human life, which a person of any given age may expect to enjoy on an equality of chance.

According to Mr Simpson, by the expectation of life we are not to understand that period which a person may have an equal chance of surviving, which is a different and more simple consideration; but the number of years at which the purchase of an annuity ought to be valued, granted on it without discount of money. There will be a greater or less difference in this number of years, in proportion to the various degrees of mortality to which the different stages of human life are exposed. Thus, it is more than an equal chance that an infant just come into the world, will not reach the age of 10 years; yet the expectation of life, or share of existence due to it, is almost 20 years upon an average. The reason of this vast difference is the excess of the probability of death in the first tender years of existence above that which respects the more advanced stages. If the numbers of those who die at every assignable period were always found to be on an equality, the two quantities already mentioned would be the same; but when these numbers constantly become less and less, the expectation must of consequence become the greater of the two.

EXPECTORANTS, in *Pharmacy*, medicines which promote EXPECTORATION. See MATERIA MEDICA *Index*.

EXPECTORATION, the act of evacuating or bringing up phlegm or other matters out of the trachea, lungs, &c. by coughing, hawking, spitting, &c.

EXPEDITATION, in the forest laws, signifies a cutting out the balls of a dog's fore feet for the preservation of the king's game.

Every one that keeps any great dog not expeditated forfeits three shillings and fourpence to the king. In mastiffs, not the ball of the feet, but the three claws, are to be cut to the skin. *Instit.* Part VI. p. 308.

This expeditation was to be performed once in every three years, and was done to every man's dog who lived near the forest, and even the dogs of the foresters themselves.

EXPEDITION, the march of an army to some distant place, with a view of hostilities. Such were the expeditions of Cyrus against Artaxerxes, and of Bacchus and Alexander into the Indies.

Expeditions for the recovery of the Holy Land were called *croisades*.

EXPERIENCE, a kind of knowledge acquired by long use without any teacher. It consists in the ideas of things we have seen or read, which the judgement has reflected on, to form for itself a rule or method.

Authors make three kinds of experience: The first is the simple uses of the external senses, whereby we perceive the phenomena of natural things without any direct attention thereto, or making any application thereof. The second is, when we premeditatedly and designedly make trials of various things, or observe those done by others, attending closely to all effects and circumstances. The third is that preceded by a foreknowledge, or at least an apprehension of the event,

and

and determines whether the apprehension were true or false; which two latter kinds, especially the third, are of great service in philosophy.

EXPERIMENT, in *Philosophy*, is the trial of the

result or effect of the application and motions of certain natural bodies, in order to discover something of their motions and relations, by which some of their phenomena or causes may be ascertained.

EXPERIMENTAL PHILOSOPHY,

IS that which has its foundation in experience, where- in nothing is assumed as a truth but what is founded upon ocular demonstration, or which cannot be denied without violating the common sense and perceptions of all mankind.

In former times philosophers, when reasoning about natural things, instead of following this method, assumed such principles as they imagined sufficient for explaining the phenomena, without considering whether these principles were just or not. Hence for a great number of ages no progress was made in science; but systems were heaped upon systems, having neither consistency with one another nor with themselves. No proper explanations indeed were given of any thing; for all these systems, when narrowly examined, were found to consist merely in changes of words, which were often very absurd and barbarous. The first who deviated from this method of philosophizing, if we may call it by that name, was Friar Bacon, who lived in the 13th century, and who spent 2000l. (an immense sum in those days) in making experiments. The Admirable Crichton, who flourished about the year 1580, not only disputed against the philosophy of Aristotle, which had for so long been in vogue, but wrote a book against it. Cotemporary with this celebrated personage was Francis Bacon lord chancellor of England, who is looked upon to be the founder of the present mode of philosophizing by experiments. But though others might lay the foundation, Sir Isaac Newton is justly allowed to have brought this kind of philosophy to perfection; and to him we are certainly indebted for the greatest part of it. Unfortunately, however, neither Lord Bacon nor Sir Isaac Newton had an opportunity of knowing many important facts relating to the principles of fire and electricity, which have since been brought to light. Hence all their philosophy was merely mechanical, or derived from the visible operations of solid bodies, or of the grosser fluids, upon one another. In such cases, therefore, where the more subtle and active fluids were concerned, they fell into mistakes, or were obliged to deny the existence of the principles altogether, and to make use of terms which were equally unintelligible and incapable of conveying any information with those of their predecessors. A remarkable instance of the errors into which they were thus betrayed, we have in the doctrine of projectiles, where the most enormous deviations from truth were sanctified by the greatest names of the last century, merely by reasoning from the resistance of the air to bodies moving slowly and visibly, to its resistance to the same bodies when moved with high degrees of velocity †. In other cases they were reduced to make use of words to express immechanical powers, as attraction, repulsion, rarefaction, &c. which have since tend-

† See Gun-
nery.

ed in no small degree to embarrass and confound science by the disputes that have taken place concerning them. The foundations of the present system of experimental philosophy are as follows:—

I. All the material substances of which the universe is composed are called *natural bodies*. What we perceive uniform and invariable in these substances we call their *properties*. Some of these are general and common to all matter, as extension; others are proper to particular substances, for instance fluidity; while some appear to be compounded of general and particular properties, and thus belong to a still smaller number; as the properties of air, which are derived from the general property of extension combined with those of fluidity, elasticity, &c.

II. In taking a particular review of the properties of bodies we naturally begin with that of *extension*. This manifests itself by the three dimensions of length, breadth, and thickness. Hence proceeds the divisibility of matter; which the present system supposes to reach even to infinity: but though this proposition be supported by mathematical demonstrations, it is impossible we can either have any distinct idea of it, or of the opposite doctrine, which teaches that matter is composed of excessively minute particles called *atoms*, which cannot be divided into smaller ones. The subtilty indeed to which solid bodies may be reduced by mechanical means is very surprising; and in some cases is so great, that we might be tempted to suppose that a farther division is impossible. Thus, in grinding a speculum, the inequalities of its surface are so effectually worn off, that the whole becomes in a certain degree invisible, showing not itself by the light which falls upon it, but the image of other bodies; but the smallest scratch which disturbs the equality of the surface is at once distinctly visible.

III. From the arrangement of these ultimate particles of matter, whatever we suppose them to be, arise the various figures of bodies: and hence figure is a property of all bodies no less universal than extension, unless we choose to speak of the ultimate particles of matter, which, as they are supposed to be destitute of parts, must consequently be equally destitute of figure; and the same consequence will follow whether we adopt this supposition or the other. The figures of bodies are so extremely various and dissimilar, that it is impossible to find any two perfectly alike. It is indeed the next thing to impossible to find two in which the dissimilarity may not be perceived by the naked eye; but if any such should be found, the microscope will quickly discover the imbecility of our senses in this respect. Solidity is another property essential to all matter. By this we mean that property which one quantity of matter has of excluding any other from the space which itself occupies.

occupies at that time. Hence arises what we call *resistance*, which is always an indication of solidity; and no less so in those bodies which we call *fluid* than in those which are the most solid. This may at first seem to be a contradiction; but fluids yield only when they can get away from the pressure; in all other cases they resist as violently as the most solid bodies. Thus water confined in a tube will as effectually resist the impression of a piston thrust down upon it as though it were the most solid substance. Air indeed will yield for a certain time; but this, as appears from several experiments, is entirely owing to a more subtle fluid, viz. that of elementary fire, being pressed out from among its particles. As long as this fluid can be forced out, either from among the particles of air, water, or any other more gross fluid substance, the latter will be found compressible, as a heap of wet sand would be by squeezing the water out from it; but when we come to the most subtle of all elements, such as we suppose that of fire to be, there cannot be any possibility of compressing it, even though we had a vessel so close as to prevent it from escaping through its sides; because its parts are already as near each other as they can be.

IV. The distance of the parts of bodies from each other is what we call their porosity, and was formerly supposed to be owing to a vacuum interspersed between them; but now it is generally allowed that the pores of solid bodies as well as of fluids are filled with an extremely subtle matter which pervades all nature. The porosity of bodies with regard to one another may be thus explained. Wood or a sponge is porous with regard to water: but water itself is porous with regard to air, which it absorbs in considerable quantity. But air and water are porous with regard to the element of fire, which produces very considerable changes upon them, according to the quantity of it they contain, or the manner it acts in their pores. This element itself, however, is not porous with regard to any other substance. Its pores, therefore, if it has any, must be absolute vacuities, destitute of any matter whatever. Vacuities of this kind indeed are supposed to be absolutely necessary to motion: for though we may say, matter being divisible almost *ad infinitum*, that a body or substance more solid may move in another substance that is more subtle, and that will give way to its motion, we must nevertheless have recourse to a last resort, and admit of an ultimate vacuum, which will give room sufficient to the least corpuscle, that its part *A* may take the place of its part *B* without the least resistance: besides, it is not to be imagined, that nature, in fact, admits of that infinite divisibility which our imagination can conceive, and that every thing which is possible in idea, is at all times practicable. All that exists is possible, but all that is possible does not however exist. By density, is understood the proportion between the extension and solidity of a body; one body therefore is more dense than another, when, under the same degree of extension, it contains more solid matter: and this quality arises from condensation and compression. Elasticity is nothing more than that effort by which certain bodies, when compressed, endeavour to restore themselves to their former state; and this property supposes them compressible. As all these natural properties of bodies are of great utility in explaining the principles of physics and in applying them to all the

arts, experimental philosophy proves their reality by a thousand examples.

V. We discover still other properties in bodies; such as mobility, which we must not here confound with motion. This mobility arises from certain dispositions which are not in an equal degree in all bodies: from whence it comes that some are more easily moved than others: and this proceeds from the resistance to motion which is perceived in all bodies, having regard merely to their masses; and this resistance is called *vis inertiae*, or *inert force*. A body is said to be in motion when it is actually moving from one place to another: or, whenever a body changes its situation with regard to the objects that surround it, either nearly or remotely, it is said to be in motion. There are three principal matters to be considered in a moving body; its direction, its velocity, and the quantity of its motion: and here physics explains the force or moving power; it likewise distinguishes between simple and compound motion. Simple motion is that which arises from only one force, or which tends to one point only. It describes the laws, and explains the resistance, of mediums; the resistance of friction; the difficulties of a perpetual motion; the alteration of direction occasioned by the opposition of a fluid matter; reflected or reverberated motion; the communication of motion by the shock of bodies, &c. Compound motion is that of a body impelled to move by several causes or powers which act according to their different directions. Physics here likewise investigates the laws of motion; and is particularly applied to the explaining, under this head, what are called the *central forces*, which produce a motion that is either circular or in a curve line, and which incessantly urge the moving body either to approach or recede from the centre. To distinguish these from each other, the former is called the *centripetal force*, and the latter the *centrifugal force*. See DYNAMICS.

VI. By gravity, or ponderosity, is to be understood that force which occasions bodies to pass from a higher to a lower place, when nothing opposes their course, or when the obstacles are not sufficient to stop them. Speculative philosophy investigates its cause, and perhaps in vain. Experimental philosophy contents itself with describing the phenomena, and teaching the laws of gravity, which are thoroughly established by a thousand reiterated experiments. In order properly to understand this subject, we must take care not to confound the term *gravity* with that of *weight*. By the former, we understand that force which urges bodies to descend through a certain space in a given time. By the latter, is meant the quantity of a heavy body that is contained under the same bulk. The phenomena are explained by the experiments themselves, and by inferences deduced from them.

VII. Hydrostatics is a science of which the object is the gravity and equilibrium of fluids in particular. Though the gravity of these bodies is the same with that of others, and is subject to the same laws, yet their state of fluidity gives rise to particular phenomena, which it is of consequence to know. But as hydrostatics cannot be successfully treated on without the assistance of calculation, it has been ranked among the mathematical sciences.

VIII. We say the same with regard to mechanics; which is the art of employing, by the aid of machines, the

the motion of bodies, in conformity to its properties and laws, as well with regard to solids as fluids, either more commodiously or more advantageously.

IX. After it has made the most accurate experiments, and the most judicious observations, on all these different subjects, and the properties of bodies in particular, Experimental Philosophy passes to the examination of the air, the water, fire, the wind, colours, &c. The air is a fluid with which we are surrounded from the instant of our birth, and without which we cannot exist. It is by the properties and the influences of the air, that nature gives increase and perfection to all that it produces for our wants and conveniences: it is the spirit of navigation: sound, voice, speech itself, are nothing more than percussions of the air: this globe that we inhabit is completely surrounded by air; and this kind of coverture, which is commonly called the *atmosphere*, has such remarkable functions, that it evidently appears to concur to the mechanism of nature. Experimental physics, therefore, considers the air, 1. Of itself, independent of its bulk, and the figure of its whole body: it examines its essential properties; as its gravity, density, spring, &c. The air-pump is here of indispensable use; and by this machine physics examines in what manner space, or a vacuum, is made. It likewise shows the necessity of air to the preservation of animal life; the effect it has on sound, fire, and gunpowder, *in vacuo*; and a hundred other experiments of various degrees of curiosity. 2. It considers the air as the terrestrial atmosphere, sometimes as a fluid at rest, and sometimes as in motion. And by these means it accounts for the variation of the mercury in the barometer, and why it sinks in proportion as the height of the atmosphere diminishes; as also for the figure, the extent, and weight of the atmosphere: it shows the method of determining the height of mountains, the nature of sound in general, of its propagation, and of sonorous bodies. The late discoveries have added greatly to experimental philosophy, of which an account is given under the article CHEMISTRY, &c.

X. It is here also, that experimental philosophy considers the nature of the wind; which is nothing more than agitated air, a portion of the atmosphere that moves like a current, with a certain velocity and determinate direction. This fluid, with regard to its direction, takes different names according to the different points of the horizon from whence it comes, as east, west, north, and south. Winds are likewise distinguished into three sorts; one of which is called *general* or *constant*, as the trade winds which continually blow between the tropics: another is the *periodical*, which always begin and end within a certain time of the year, or a certain hour of the day, as the monsoons, the land breezes and sea breezes, which arise constantly in the morning and evening; and lastly, such as are *variable*, as well with regard to their direction as their velocity and duration.

M. Mariotte computes the velocity of the most impetuous wind to be at the rate of 32 feet in a second, and Mr Derham makes it 66 feet in the same time. The first, doubtless, meant the wind of the greatest velocity that had then come to his knowledge. The invention of aerostatic machines has tended more to show the real velocity of the wind than any other invention as yet made public: but all of them move slower than the

aerial current; so that the real velocity of the wind remains yet undetermined.

XI. The force of the wind, like that of other bodies, depends on its velocity and mass: that is, the quantity of air which is in motion; so the same wind has more or less force on any obstacle that opposes it, in proportion as that obstacle presents a greater or a less surface: for which reason it is that they spread the sails of a vessel more or less, and place the wings of a windmill in different directions. The machines by which the winds are measured, are called *anemometers*. They show the direction, the velocity, and the duration of winds. It is by the agitations of the winds that the air is purified; that the seeds of trees and herbs are conveyed through the forests and fields; that ships are driven from one pole to the other; that our mills turn upon their axles, &c.: and art, by imitating nature, sometimes procures us artificial winds, by which we refresh our bodies, invigorate our fires, purify our corn, &c.

XII. Water is an universal agent, which nature employs in all her productions. It may be considered as in three states: 1. As a liquid; 2. As a vapour; 3. As ice. These three different states do not in any manner change its essence, but make it proper to answer different ends. The natural state of water would be that of a solid body, as fat, wax, and all those other bodies which are only fluid when heated to a certain degree; for water would be constantly ice, if the particles of fire, by which it is penetrated in the temperate climates, did not render it fluid, by producing a reciprocal motion among its parts; and, in a country where the cold is continually strong enough to maintain the congelation, the assistance of art is necessary to make it fluid in the same manner as we do lead, &c. Water, when not in ice, is a fluid that is insipid, transparent, without colour and without smell, and that easily adheres to the surface of some bodies, that penetrates many, and extinguishes fire. Experimental philosophy investigates the origin of fountains; the cause of the saltiness of the sea; the means of purifying water; what is its weight, and what are its effects when heated, &c. It likewise examines this fluid in the state of vapour; and finds that a drop of water, when in vapour, occupies a space vastly greater than it did before. It explains the *æolipile* and its effects; fire engines; and the force of vapour that gives motion to immense machines in mines and elsewhere, &c. And lastly, It considers water in the state of ice. Ice consequently is more cold than water; and its coldness increases if it continue to lose that matter, already too rare, or too little active, to render it fluid. Experimental physics endeavours to investigate the causes of the congelation of water, and why ice is lighter than water; from whence it derives that expansive force by which it breaks the containing vessel; the difference there is between the congelation of rivers and that of standing waters; why ice becomes more cold by the mixture of salts; and many other similar phenomena.

XIII. The nature of fire is yet very much unknown to the most learned philosophers. As objects when at a great distance are not perceptible to our senses, so when we examine them too nearly, we discern them but confusedly. It is still disputed whether fire be a homogeneous, unalterable matter, designed, by its presence, or by its

EXPERIMENTAL PHILOSOPHY.

action, to produce heat, inflammation, and dissolution, in bodies: or if its essence consists in motion only, or in the fermentation of those particles which we call *inflammable*, and which enter as principles, in greater or less quantities, in the composition of mixed bodies. The most learned inquirers into nature incline to the former opinion; and to have recourse to a matter which they regard as the principle of fire. They suppose that there is in nature a fluid adapted to this purpose, created such from the beginning, and that nothing more is necessary than to put it in action. The numberless experiments which are daily made in electricity seem to favour this opinion, and to prove that this matter, this fluid, this elementary fire, is diffused through all nature, and in all bodies, even ice itself. We cannot say to what important knowledge this great discovery of electricity may lead if we continue our inquiries concerning it. It appears, however, that we may believe, without any inconvenience or absurdity, that fire and light, considered in their first principle, are one and the same substance differently modified.

XIV. Be this matter however as it may, experimental philosophy is employed in making the most ingenious and most useful researches concerning the nature of fire, its propagation, and the means by which its power may be excited or augmented; concerning the phosphorus and its inflammation; fire excited by the reflection of the sun's rays from a mirror; and on the effects of fire in general; concerning lightning and its effects; the fusion of metals; gunpowder and its explosion; flame and the aliments of fire; and an infinity of like objects which it explains, or concerning which it makes new discoveries, by the aid of experiments.

XV. By the word *light*, we understand that agent by which nature affects the eye with that lively and almost constantly pleasing sensation, which we call *seeing*, and by which we discern the size, figure, colour, and situation of objects, when at a convenient distance. All philosophers agree, that the light, which is diffused in any place, is a real body. But what this body is, and by what means it enters that place where it is perceived, is a question about which philosophers are divided.

XVI. Experimental philosophy is applied in discovering or proving, by an infinity of experiments, what is the nature of light, in what manner it is propagated,

what its velocity and progressive motion. It also investigates and explains the principles of *optics* properly so called, and shows the directions which light observes in its motions. From thence it proceeds to the examen of the principles of *catoptrics*, and describes the laws and effects of reflected light. It next treats of the principles of *dioptrics*, and explains the laws of refracted light; and lastly, it teaches, from the principles of natural and artificial vision, the construction of optical instruments, as lenses, concave mirrors, prisms, telescopes, &c. &c. and the uses to which they are applied.

XVII. By resolving or separating the rays of light, philosophy has obtained true and clear discoveries of the nature of colours. We are naturally led to imagine that colours, and their different degrees, make a part of the bodies that present them to our sight; that white is inherent in snow, green in leaves and grass, and red in a stuff dyed of that colour. But this is far from being true. If an object, which presents any colour to our sight, be not illuminated, it presents no colour whatsoever. In the night all is black. Colours therefore depend on light; for without that we could form no idea of them; but they depend also on bodies; for of several objects presented to the same light, some appear white, others red, blue, &c. But all these matters being separate from our own bodies, we should never acquire any ideas of them, if the light, transmitted or reflected by these objects, did not make them sensible to us, by striking upon the organs of our sight, and if these impressions did not revive in us those ideas which we have been used to express by certain terms. For these reasons philosophy considers colours from three points of view, 1. As in the light; 2. In bodies, as being coloured; and, 3. From the relation they have to our visual faculties, which they particularly affect, and by which we are enabled to distinguish them.

It is unnecessary in this place to say more either on colour in particular or experimental philosophy in general. The different subjects of this collective article are particularly treated under their proper names, in the order of the alphabet: the reader will therefore turn, as he has occasion, to *ACOUSTICS*, *CATOPTRICS*, *CHROMATICS*, *DIOPTRICS*, *HYDROSTATICS*, *MECHANICS*, *OPTICS*, *PNEUMATICS*, *ELECTRICITY*, *MAGNETISM*, &c. &c. &c. Also, *AEROSTATION*, *ATMOSPHERE*, *BURNING Glass*, *CHEMISTRY*, &c. &c.

E X P

Experimentum or decisive experiment; thus termed, either on account of its being like a cross, or direction-post placed in the meeting of several roads, guiding men to the true knowledge of the nature of that thing they are inquiring after; or, on account of its being a kind of torture, whereby the nature of the thing is as it were extorted by force.

EXPHORESIS. See *ORATORY*, N° 85.

EXPIATION, a religious act, by which satisfac-

E X P

tion or atonement is made for the commission of some crime, the guilt done away, and the obligation to punishment cancelled.

Expiations among the Heathens, were of several kinds; as sacrifices and religious washings. They were used for effacing a crime, averting any calamity, and on numberless other occasions, as purifying towns, temples, and sacred places, and armies before and after battle. And they were performed for whole cities as well as particular persons.

The

Expiation || **Explosion.** The method of expiation among the Jews was chiefly by sacrifice, whether for sins of ignorance, or to purify themselves from certain pollutions.

Fest of EXPIATION, among the Jews, called by our translators the *day of atonement*, was held on the tenth day of Tisri, or the seventh month of the Jewish year, answering to part of our September and October. It was instituted by God himself, Levit. xxiii. 27, &c. On that day the high-priest, the figure or type of Jesus Christ, entered into the most holy place, and confessed his sins; and, after several ceremonies, made an atonement for all the people, to wash them from their sins. Lev. chap. xvi. See *SCAPE-Goat*.

EXPIATION, in a figurative sense, is applied by divines to the pardon procured to the sins of the penitent by the merit of Christ's death. See the article **CHRISTIANITY**.

EXPIRATION, in *Medicine*. See **EXPIRATION**.

EXPIRATION, is also used figuratively, for the end of a term of time granted, agreed on, or adjudged.

EXPLICIT, in the schools, something clear, distinct, formal, and unfolded.

EXPLOSION, in *Natural Philosophy*, a sudden and violent expansion of an aerial or other elastic fluid, by which it instantly throws off any obstacle that happens to be in the way, sometimes with incredible force, and in such a manner as to produce the most astonishing effects upon the neighbouring objects.

Difference between explosion and expansion. Explosion differs from expansion, in that the latter is a gradual and continued power, acting uniformly for some time, whereas the former is always sudden, and only of momentary duration. The expansions of solid substances do not terminate in violent explosions, on account of their slowness, and the small space through which the metal, or other expanding substance, moves; though their strength may be equally great with that of the most active aerial fluids. Thus we find, that though wedges of wood, when wetted, will cleave solid blocks of stone, they never throw them to any distance, as is the case with gunpowder. On the other hand, it is seldom that the expansion of any elastic fluid bursts a solid substance without throwing the fragments of it to a considerable distance, the effects of which are often very terrible. The reasons of this may be comprised in the two following particulars:

General causes of explosions.

1. The immense velocity with which the aerial fluids expand, when affected by a considerable degree of heat; and, 2. Their celerity in acquiring heat and being affected by it, which is much superior to that of solid substances. Thus air, heated as much as iron when brought to a white heat, is expanded to four times its bulk; but the metal itself will not be expanded the 500th part of the space. In the case of gunpowder, which is a violent and well known explosive substance, the velocity with which the flame moves is calculated by Mr Robins, in his *Treatise upon Gunnery*, to be no less than 7000 feet in a second, or little less than 79 miles per minute. Hence the impulse of the fluid is inconceivably great, and the obstacles on which it strikes are hurried off with vast velocity, though much less than that just mentioned; for a cannon bullet, with the greatest charge of powder that can be conveniently given, does not move at a greater rate than 2400 feet per second, or little more than 27 miles per minute. The velocity of the bullet again is promoted

by the sudden propagation of the heat through the whole body of air, as soon as it is extricated from the materials of which the gunpowder is made; so that it is enabled to strike all at once, and thus greatly to augment the momentum of the ball. It is evident that this contributes very much to the force of the explosion, by what happens when powder is wetted or mixed with any substance, which prevents it from taking fire all at once. In this case the force of the explosion, even when the same quantity of powder is made use of, cannot be compared to that of dry powder.

Explosion

Upon these principles we may conclude, that the force of an explosion depends, 1. On the quantity of elastic fluid to be expanded; 2. On the velocity it acquires by a certain degree of heat; and, 3. On the celerity with which the degree of heat affects the whole of the expansive fluid. These three take place in the greatest perfection where the electric fluid is concerned; as in cases of lightning, earthquakes, and volcanoes. This fluid, as is shown in many parts of this work, differs not from elementary fire or the light of the sun; it pervades the whole system of nature; its expansion is nothing else than its motion from a centre towards a circumference, for it does not seem capable of any proper expansion by a separation of its parts like any other fluid. Hence, when it begins to expand in this manner, the motion is propagated through it with a velocity far exceeding that of any other fluid whatever. Thus, even when the quantity is excessively small, as when an electric spark is sent through a glass full of water or of oil, the expansion is so violent as to dissipate the glass into innumerable fragments with great danger to the by-standers, as is observed under the article **ELECTRICITY**. In violent lightning, where the electric fluid collects itself into balls, the strength of the explosion is proportionable to the quantity. Every one has heard of the prodigious effects of lightning when it happens to strike buildings, trees, or even the most solid rocks; and in some cases, where the quantity of electricity is still greater than in any flash of lightning, we hear of still more tremendous consequences ensuing. Dr Priestley gives an instance of a large fire ball (undoubtedly a quantity of electric matter) rolling on the surface of the sea, which after rising up to the top-mast of a ship of war, burst with such violence that the explosion resembled the discharge of hundreds of cannon fired at once. Great damage was done by it; but there is not the least doubt that most of its force was spent on the air, or carried down to the sea by the mast and iron work of the ship. Indeed, considering that in all cases a great part of the force of electric explosions is dissipated in this manner, it may justly be doubted whether they can be measured by any method applicable to the mensuration of other forces. Even in artificial electricity the force is prodigiously great; insomuch that Dr Van Marum calculated that of the great battery belonging to the machine in Teyler's museum to be upwards of 900 pounds.

Electric explosions the strongest of all.

In those cases where the electrical matter acts like common fire, the force of the explosions, though exceedingly great, is capable of mensuration by comparing the distances to which the bodies are thrown with their weight. This is most evident in volcanoes, where the projections of the burning rocks and lava manifest

Volcanic explosions next in strength.

Explosion. the greatness of the power, at the same time that they afford a method of measuring it. These explosions, as is shown under the article VOLCANO, are owing to extrication of aerial vapours, and their rarefaction by intense heat. In all of them the air is originally in a state of decomposition, viz. its invisible and solid part is joined with some terrestrial substances. Thus, when fixed air, for instance, is exposed to any pure earth which attracts it, as calcined magnesia, a decomposition instantly takes place. All these vapours are composed of elementary fire and some invisible substance capable of assuming a solid form. The decomposition just mentioned is therefore easily explained; the solid part of the air joins itself to the magnesia, while the elementary fire or latent heat is dissipated, and passes through the sides of the vessel. Were it now in our power suddenly to restore the latent heat to the whole of the fixed air, so that it would at once assume its former expansion, a violent explosion would follow. This seems to be precisely the case with the volcanic explosions. An immense quantity of the fixed part of different aerial fluids is united to the various substances found below the surface of the earth. By means of the electric fire which kindles the volcanoes, the aerial fluids are suddenly restored to their elastic state; and not only so, but their natural elasticity is greatly augmented, so that the explosions take place with great violence. The case is the same with gunpowder; only that the condensed air in this case is at first of the dephlogisticated kind, but is quickly phlogisticated by reason of the combustible matters mixed with the nitre, while the heat produced by the inflammation augments the elasticity of the generated air to four times what it usually is, so that the whole force of the explosion is calculated at 1000 times the pressure of the common atmosphere †.

In what manner aerial explosions take place.

Explosion of gunpowder explained.

† See the article *Gunnery*.

Of pulvis fulminans, &c.

Thus the explosions of gunpowder and of volcanoes are essentially the same. The reason of the extreme quickness of those of gunpowder is, that it takes fire so readily by the intimate mixture and combustibility of all the materials. In volcanoes the explosions likewise follow one another very quickly, and are by no means inferior in strength to those of gunpowder: but here the quantity of vapour makes up for the comparative slowness with which it is affected by the heat. Thus, though we could not by any means contrive to fire cannon in quick succession by means of calcareous earth as we can do with gunpowder, yet in the huge furnace of a volcano the elastic matter is supplied in such quantities, that the explosions are in a manner unremitting; and even in ordinary experiments the confinement of aerial vapours has often occasioned violent explosions in chemical vessels. In one case too the extrication of fixed air adds excessively to the force of an explosion, viz. in that of pulvis fulminans. This is compounded of sulphur, saltpetre, and salt of tartar. The latter we know contains much fixed air: and it is probable that the violence of the explosion is occasioned by this air; for the greater quantity of it that the alkaline salt contains, the greater force does it explode with. Fulminating gold emits a quantity of phlogisticated air, to which its explosive power is supposed to be owing, as is explained under the article CHEMISTRY; but that of fulminating silver is so extraordinary, that scarce any force of aerial vapour that can be extricated

is likely to produce it, and it seems probable that electricity itself is concerned.

Next in strength to the aerial vapours are those of aqueous and other liquids. The most remarkable effects of these are observed in steam engines; but there is one particular case from which it has been inferred that aqueous steam is vastly stronger than the flame of gunpowder. This is when water is thrown upon melted copper; for here the explosion is so strong as almost to exceed imagination; and the most terrible accidents have been known to happen from such a slight cause as one of the workmen spitting in the furnace where copper was melting. Here, however, it is most probable that a decomposition of the water takes place. That this element can be decomposed, or resolved into elastic vapours, has been completely established by the most satisfactory experiments, and is now, we believe, universally admitted by chemical philosophers. See WATER, CHEMISTRY *Index*. The position is indeed denied by the phlogistians; but their arguments appear not to be conclusive; nor is it a fact which militates in the least against their principles. On the supposition that the water is decomposed in the present case, however, the phenomenon in question is easily solved. The water being thrown in substance upon the melted copper, is decomposed by the violent heat; and one part of it adheres to the metal, thus converting it into a calx, or oxide, while the other is converted into inflammable air, or hydrogen gas, which expanding suddenly, throws the melted metal all about with the greatest violence by means of its reaction.

Explosion.

Explosions by aqueous vapours.

Violent explosion of water with melted copper.

Probably owing to a decomposition of the water.

Particularly explained.

To understand the manner in which this is accomplished, we must consider some of the principles of GUNNERY laid down by Mr Robins, and related under that article. One of these is, that though the air, in cases of ordinary velocity, makes no great resistance, it is far otherwise where the velocity of the moving body becomes very great. In all cases of explosion also there is in the first instance a resisting vacuum made by the exploding fluid; and consequently the weight of the atmosphere is to be overcome, which amounts to about 14 pounds on every square inch of surface. Supposing the surface of the exploding fluid, then, on that of melted copper, to contain an area of 4 square inches, it meets with a resistance of 60 pounds from the atmosphere, and consequently communicates an equal pressure to the fluid metal. Even this must of consequence throw it about, unless the same pressure was exactly diffused over every part of the surface. But much more must this effect be increased by the immense velocity with which the fluid moves, and by which the resistance of the atmosphere is augmented in a prodigious degree, as is explained under the article GUNNERY. The elastic fluid generated is then confined not only by the fluid metal and sides of the furnace, but by the air itself, which cannot get out of the way; so that the whole resembles a cannon closed at the mouth, and filled with inflamed gunpowder. Hence not only the melted metal, but the furnace itself and the adjacent walls of the building, are hurried off as they would be by the firing of a great quantity of gunpowder in a small space, and which is well known to produce analogous effects.

In explaining the phenomenon in question, Dr Black supposes that the mere heat of the metal applied to the aqueous

Explosion. aqueous steam produces the explosion; and in proof of this alleges, that copper imbibes a greater quantity of heat during fusion than any other metal. Aqueous steam, however, seems to be too slow for producing such sudden and violent effects. Explosions, it is true, will be occasioned by it, but then it must be confined for a very considerable time; whereas the effects of water thrown upon melted copper are instantaneous.

Why such explosions do not take place with other metals. It may now be asked, Why such explosions do not take place with any other metal, iron for instance, when water is thrown upon its surface in fusion? In answer to this we must observe, That though water is decomposed by being applied to red-hot iron in the form of steam, yet there is a possibility, that when the same element is applied in substance to the fluid metal, no decomposition may ensue. Something like this indeed happens with copper itself; for, notwithstanding the violent effects which take place on the contact of water in substance with the melted metal, no explosion happens though aqueous steam be blown upon its surface. On the contrary, the upper part of the metal is thus cooled, and forms itself into cakes, which are afterwards taken off, and new ones formed in the same manner; neither does aqueous steam affect red-hot copper in the manner that it does iron in the same state.

Explosions when heated substances are thrown upon small quantities of water. A decisive proof that the explosion is not occasioned by the mere heat of the aqueous steam may be deduced from the example of melted glass, which produces no explosion though we pour water upon it in that state; and yet the heat of melted glass is undoubtedly equal at least to that of melted copper. It must be observed, however, that in all cases where a very hot body is thrown upon a small quantity of water in substance, an explosion will follow; but here the water is confined and suddenly rarefied into steam, which cannot get away without throwing off the body which confines it. Examples of this kind frequently occur where masons or other mechanics are employed in fastening cramps of iron into stones; where, if there happens to be a little water in the hole into which the lead is poured, the latter will fly out in such a manner as sometimes to burn them severely. Terrible accidents of this kind have sometimes happened in founderies, when large quantities of melted metal have been poured into wet moulds. In these cases, the sudden expansion of the aqueous steam has thrown out the metal with violence; and if any decomposition has taken place at the same time, so as to convert the aqueous into an aerial vapour, the explosion must be still greater.

By pouring cold water into boiling oil. To this last kind of explosion we must refer that which takes place on pouring cold water into boiling or burning oil or tallow. Here the case is much the same whether we pour the oil on the water, or the water on the oil. In the former case, the water which lies at the bottom is rarefied into steam, and explodes; in the latter, it sinks down through the oil by its superior specific gravity, and explodes as it passes along. In either case, however, the quantity of aqueous fluid must be but small in proportion to that of the oil: a very great quantity would put out the flame, or destroy the heat, in whatever way we applied it.

Explosions in solid substances explained. Another kind of explosion is that which takes place in solid substances, where we can scarcely suppose either aqueous or aerial vapours to be concerned. The most remarkable of these are the *volcanic bombs* mentioned

by Sir William Hamilton in the great eruption of Vesuvius in 1779. They were large pieces of lava which burst in pieces like bombs as they fell to the ground; but he does not inform us whether their bursting was attended with any great violence or not. Indeed, amidst such scenes of horror, and the continual tremendous explosions of the volcano, smaller phenomena of this kind would probably be overlooked. Other examples are the *Glass Tears*, of which an account is given under that article; the bursting of electrical globes, when put in motion; of other glass vessels spontaneously, and seemingly without any cause; and lastly, the bursting of large cast metal vessels in the act of cooling. These are all so similar to one another, that it is probable they depend on one general cause. All of them agree in this respect, that the extreme parts of them are considerably cooled, while the internal remain very hot. Thus, in the volcanic bombs, the current of air, formed by their swift passage through it in falling, necessarily carries off a great quantity of heat from the parts which are in contact with it, while the rest are scarce at all cooled. The glass-tears are artificially cooled on the outside by dropping them upon water; and in consequence of this, their explosion is probably more violent in proportion to their bulk than that of the volcanic bombs. Glass vessels only burst spontaneously when they have not been well annealed; and we know that this bad annealing consists only in applying cold too suddenly to the outside. Something like this probably takes place when cast-iron vessels explode; and we are certain it does so with electrical globes, for these last are not apt to burst if they have been well annealed. In all cases, therefore, there is a remarkable contraction of the outward surface by the cold, while the internal parts remain as much expanded as ever. In this case there must be a continual effort of that subtle fluid called *elementary fire*, from the internal to the external part, as the contraction gradually proceeds the contrary way. Thus, when a volcanic bomb, for instance, is cooled on the outside, its parts are consolidated so that the internal fluid has not such an easy passage through it as is necessary. In consequence of this it makes a greater effort, which is still farther augmented by the cooling and contraction of the internal parts squeezing the fluid out from among themselves, and forcing it to recoil upon that in the centre, as well as to exert itself against the external part; from which united operation the effect already mentioned at last takes place. This explanation, however, does not hold with respect to electrical globes, glass tears, or ill annealed glass: but in order to accommodate it to all these, we have only to remember, that *fire*, and the electric fluid acting from a centre to a circumference, are not in the least different; so that from whatever cause the electric matter is disposed to act in this manner, the same effect will follow, i. e. an explosion will take place if the substance does not afford an equally ready passage through all its parts, and that whether any sensible heat is felt in it or not.

The only other kind of explosion we have to take notice of is that produced by inflammable and dephlogisticated air, or oxygen and hydrogen gases, when mixed together and set on fire. This differs from any of those hitherto considered, because in reality there is an absolute

Explosion.

lute condensation rather than an expansion throughout the whole of the operation; and the result is the formation of water; and could the air be made to take fire throughout their whole substance absolutely at the same instant, there would be no explosion, but only a sudden production of heat. From this cause also is derived a very singular phenomenon taken notice of by Dr Priestley in his experiments on that subject, recorded in the Phil. Transf. Having enclosed several quantities of inflammable and dephlogisticated air in a copper vessel, firing them afterwards by the electric sparks, he found that the force of the explosion was directed more towards one part of the vessel than another; least on that part where the electrical discharge was made, and most upon that which was farthest from it. This inequality was very considerable; insomuch that he could not repeat his experiments any number of times without injuring the vessel in that part which was farthest from the discharge. The reason he gives for this is, that the mixture was not fired at the same instant, but first at the place where the discharge was made. This first explosion would have acted equally upon all parts of the vessel, had it not been for the intervention of the air. By the first momentary explosion, however, the air in the farthest part of the vessel was condensed, so that the next explosion was made stronger, while the copper in the fore part of the vessel had the whole of this strong explosion to resist, the hinder part being but little concerned, as the air in it was condensed and reduced almost to a vacuum.

Singular phenomenon observed by Dr Priestley.

Uses to which explosions are applied.

Though the phenomena of explosions are sometimes very destructive, they are likewise of considerable use in life, by removing obstacles which could scarcely be got the better of by any mechanical power whatever. The principal of these are the blowing up of rocks, the separating of stones in quarries, and other purposes of that kind. The destruction occasioned by them in times of war, and the machines formed upon the principle of explosion for the destruction of the human race, are well known; and if we cannot call these *useful*, we must allow them at least to be necessary evils. For the production of explosions, gunpowder is the only substance that has yet been found to answer; nevertheless, as its use is attended with considerable expence, several attempts have been made to find out a cheap substitute for it. One of the most remarkable of these was by mixing small quantities of water, enclosed in little bladders or some easily destructible vehicles, along with a charge of powder. By this contrivance it was hoped that the water being converted into vapour when the powder was inflamed, would augment the force of the explosion: but instead of this, it was found greatly to diminish it. The reason was evident, viz. that the conversion of the water into steam required so much of the latent heat of the inflamed gunpowder, that enough was not left to give the necessary expansion to the aerial fluid produced. A mixture of hydrogen and oxygen gases has also been tried; but the explosion here has always been found too weak. In mines, indeed, very terrible effects are produced by such a mixture, but in these the quantity is immense; so that the comparative weakness of the mixture cannot be discovered. Electricity therefore seems to be the only resource we have; except by adding ingredients to gunpowder which may increase the strength of it. There can be no doubt in-

Attempts to supersede the use of gunpowder.

deed that the electric fluid is possessed of sufficient strength to perform every thing we could desire; and electricians have supposed, perhaps justly enough, that a cannon charged with water might, by means of electricity, become more dangerous than one charged with gunpowder: but this fluid is so exceedingly capricious, so imperceptible and unmanageable, that the use of it cannot as yet be thought practicable, nor in all probability ever will be so.

Explosion
||
Exportation.

The effects of explosions, when violent, are felt at a considerable distance, by reason of the concussions they give to the atmosphere; for, as has been already hinted, all of them act upon the atmospheric fluid with the very same force they exert upon terrestrial substances subjected to their action. Sir William Hamilton relates, that at the explosions of Vesuvius in 1767, the doors and windows of the houses at Naples flew open if unbolted, and one door was burst open though it had been locked. A great quantity of gunpowder being put into the ditch of a fortified city, and set on fire, destroyed part of the wall, and broke down one of the gates. The blowing up of powder magazines or powder mills will destroy buildings and kill people, though certainly without the reach of the flame, and untouched by any part of the shattered magazine or mill. But the most curious effect is, that they electrify the air, and even glass windows, at a considerable distance. This is always observable in firing the guns of the Tower at London; and some years ago, after an explosion of some powder mills in the neighbourhood of that city, a great number of people were alarmed by a rattling and breaking of their china ware; which by the vulgar was taken for a supernatural phenomenon, but undoubtedly was owing to some commotion in the electrical fluid from the violent concussion of the atmosphere. In this respect, however, the effects of electrical explosions themselves are most remarkable, though not in the uncommon way just mentioned; but it is certain, that the influence of a flash of lightning is diffused for a great way round the place where the explosion happens, producing many very perceptible changes both on the animal and vegetable creation.

Effects of explosions on the atmosphere and electric fluid.

EXPONENT, in *Algebra*, the same with index. See ALGEBRA.

EXPONENT is also used in arithmetic, in the same sense as index or logarithm.

EXPONENTIAL *Calculus*, the method of differencing, or finding the fluxions of exponential quantities, and of summing up those differences, or finding their fluents.

EXPONENTIAL *Curve*, is that whose nature is defined or expressed by an exponential equation; as the curve denoted by $a^x=y$, or by $x^x=y$.

EXPONENTIAL *Equation*, is one in which is contained an exponential quantity; as the equation $a^x=b$, or $x^x=ab$, &c.

EXPONENTIAL *Quantity*, is that whose power is a variable quantity; as the expression a^x , or x^y . Exponential quantities are of several degrees and orders, according to the number of exponents or powers, one over another.

EXPORTATION, the shipping and carrying out of the kingdom wares and commodities for other countries. See the articles COMMERCE, TRADE, and SHIPPING.

EXPOSING,

Exposing
||
Expositor.

EXPOSING, the act of setting a thing to public view. In the Romish church, the sacrament is said to be *exposed* when it is shown in public uncovered on festival days, and during the time of plenary indulgences.

EXPOSING is also used with a farther latitude; thus we say, It is prohibited to expose false and clipped money. Such a house stands very high, and has a delicious prospect; but it is exposed to all the four winds. Such a city being on the frontiers, and not fortified, is exposed to the insults of every party of forces.

EXPOSING of Children, a barbarous custom practised by most of the ancients excepting the Thebans, who had an express law to the contrary, whereby it was made capital to expose children; ordaining at the same time, that such as were not in a condition to educate them should bring them to the magistrates, in order to be brought up at the public expence. Among the other Greeks, when a child was born, it was laid on the ground; and if the father designed to educate his child, he immediately took it up; but if he forbore to do this, the child was carried away and exposed. The Lacedemonians indeed had a different custom; for with them all new-born children were brought before certain triers, who were some of the gravest men in their own tribe, by whom the infants were carefully viewed; and if they were found lusty and well favoured, they gave orders for their education, and allotted a certain proportion of land for their maintenance; but if weakly or deformed, they ordered them to be cast into a deep cavern in the earth, near the mountain Taygetus, as thinking it neither for the good of the children themselves nor for the public interest, that defective children should be brought up. Many persons exposed their children only because they were not in a condition to educate them, having no intention that they should perish. It was the unhappy fate of daughters especially to be thus treated, as requiring more charges to educate and settle them in the world than sons.

The parents frequently tied jewels and rings to the children they exposed, or any other thing whereby they might afterwards discover them, if Providence took care for their safety. Another design in adorning these infants was either to encourage such as found them to nourish and educate them, if alive, or to give them human burial if dead. The places where it was usual to expose children were such as people frequented most. This was done in order that they might be found, and taken up by compassionate persons who were in circumstances to be at the expence of their education. With this intention the Egyptians and Romans chose the banks of rivers, and the Greeks the high-ways.

EXPOSITION, in general, denotes the setting a thing open to public view. See **EXPOSING**.

EXPOSITION, in a literary sense, the explaining an author, passage, writing, or the like, and setting their meaning in an obvious and clear light.

EXPOSITOR, or **EXPOSITORY**, a title which some writers have given to a lesser kind of dictionaries or vocabularies, serving to expound or explain the meaning of the obscure or difficult words of a language. It is also used in the same sense with commentary and paraphrase.

EXPOSTULATION, in *Rhetoric*, a warm address to a person who has done another some injury, representing the wrong in the strongest terms, and demanding redress.

Expostulation
||
Extensor.

EXPOSURE, in *Gardening*, the situation of a garden wall, or the like, with respect to the points of the compass, as south or east. See **GARDENING**.

Ex-post-facto, in *Law*, denotes something done after another thing that was committed before. An estate granted may be made good by matter *ex-post-facto*, that was not so at first by election, &c.

EXPRESSED OILS, such oils as are obtained from bodies only by pressing. See **CHEMISTRY** and **MATERIA MEDICA Index**.

EXPRESSION, in *Rhetoric*, the elocution, diction, or choice of words in a discourse. See **LANGUAGE**, **ORATORY**, and **POETRY**.

EXPRESSION, in *Music*. See **COMPOSITION**.

EXPRESSION, in *Painting*, a natural and lively representation of the subject, or of the several objects intended to be shown.

The expression consists chiefly in representing the human body and all its parts, in the action suitable to it: in exhibiting in the face the several passions proper to the figures, and observing the motions they impress on the external parts. See **PAINTING**.

Expression, Theatrical. See **DECLAMATION**, Article iv.

EXPRESSION, in *Medicine, Chemistry, &c.* the act of expression or extracting the juices or oils of plants, fruits, or other matters, by squeezing, wringing, or pressing them in a press. After having let the herbs infuse a due time, their juice must be drawn by expression in a linen cloth or by a press.

EXPULSION, in a general sense, the act of violently driving a person out of any city, society, &c.

EXPULSION, in *Medicine*, the act whereby any thing is forcibly driven out of the place in which it is: thus we say, the expulsion of the fetus in delivery.

EXSICCATION, (formed of *ex* and *siccus*, "dry,") in *Chemistry, &c.* the act of drying up & evaporating the moisture of a thing.

EXPIRATION, in *Physic*, that part of respiration by which the air is expelled or driven out of the lungs. See **ANATOMY Index** and **RESPIRATION**.

EXSUDATION, or **EXUDATION**, the act of sweating out. In which manner, gums, balsams, &c. are usually produced from trees.

EXTANT, something that still subsists, or is in being. It is but part of the history of Livy, of the writings of Cicero, Cæsar, &c. that are extant, the rest are lost. We have nothing extant of Socrates, though he wrote a great deal.

EXTASY, a transport which suspends the function of the senses, by the intense contemplation of some extraordinary or supernatural object.

EXTASY, in *Medicine*, a species of catalepsy, when a person perfectly remembers, after the paroxysm is over, the ideas he conceived during the time it lasted.

EXTENSION, in *Philosophy*, one of the common and essential properties of body; or that by which it possesses or takes up some part of universal space, which is called the place of that body. See **METAPHYSICS**.

EXTENSOR, an appellation given to several muscles,

Extent
||
Extortion.

muscles, from their extending or stretching the parts to which they belong. See ANATOMY, *Table of the Muscles*.

EXTENT, in *Law*, is used in a double sense. Sometimes it signifies a writ or command to the sheriff for the valuing of lands or tenements; and sometimes the act of the sheriff, or other commissioner, upon this writ.

Old and New EXTENT, in *Scots Law*. See *LAW Index*.

EXTENUATION, the act of diminishing or lessening the bulk or substance of a thing, especially of the human body. Fevers, agues, long abstinences, &c. occasion great extenuations or emaciations.

EXTENUATION, is also a figure in rhetoric, opposite to the hyperbole. The Greeks call it *μίσθωσις*.

EXTERIOR, or EXTERNAL. See EXTERNAL.

EXTERMINATION, in general, the extirpating or destroying something.

EXTERMINATION or EXTERMINATING, in *Algebra*, is used for taking away. Thus algebraists speak of exterminating surds, fractions, and unknown quantities out of equations. See *Maclaur. Algebr. Part I. Chap. 12.* where we have some general theorems for the exterminating unknown quantities in given equations.

EXTERNAL, a term of relation applied to the surface or outside of a body, or that part which appears or presents itself to the eye, touch, &c. in contradistinction to internal.

EXTERNAL is also used to signify any thing that is without side a man, or that is not within himself, particularly in his mind; in which sense we say, external objects, &c.

EXTINCTION, in general, denotes the putting out or destroying something, as a fire or flame. See *Extinguishing of FIRE*.

EXTINGUISHMENT, in *Law*, is a consolidation or union, as where one has due to him a yearly rent out of lands, and afterwards purchases the lands out of which the rent arises; in this case, both the property and the rent being united in one possessor, the rent is said to be extinguished.

EXTIRPATION, (formed of *ex* and *stirps*, "root,") the act of pulling up or destroying a thing to the very roots. Among the prayers of the Romish jubilee, there is one for the extirpation of heresy.

EXTIRPATION is also used, in *Surgery*, for cutting off any part entirely; as a wen, &c. or the eating it away, as a wart, &c. by corrosive medicines.

EXTISPEX, in antiquity, the person who drew prefaces from viewing the entrails of animals offered in sacrifice.

EXTORTION, in *Law*, is an illegal manner of wresting any thing from a man, either by force, menace, or authority. It is also the exaction of unlawful usury, winning by unlawful games, and taking more than is due under pretence of right, as excessive tolls in millers, &c.

At the common law, extortion is punishable by fine and imprisonment; and the statute of 3 Eliz. 1. c. 30. has enacted, that officers of justice guilty of extortion for the expedition of business, &c. shall render to the party treble value. There are likewise divers other statutes for punishing extortions of sheriffs, bailiffs, gaolers,

clerks of the assize and of the peace, attorneys, solicitors, &c.

EXTRACT, in *Pharmacy*, is a solution of the purer parts of a mixed body inspissated, by distillation or evaporation, nearly to the consistence of honey.

EXTRACT, in matters of literature, is something copied or collected from a book or paper.

EXTRACTION, in *Chemistry* and *Pharmacy*, the operation by which essences, tinctures, &c. are drawn from natural bodies.

EXTRACTION, in *Surgery*, is the drawing any foreign matter out of the body by the hand, or by the help of instruments. See *SURGERY*.

EXTRACTION, in genealogy, implies the stock or family from which a person is descended. See *DESCENT*.

EXTRACTION of Roots, in *Algebra* and *Arithmetic*, the methods of finding the roots of given numbers or quantities. See *ALGEBRA* and *ARITHMETIC*.

EXTRACTOR, in *Midwifery*, an instrument or forceps for extracting children by the head.

EXTRAJUDICIAL, something done out of the proper court, or the ordinary course of law. As when judgment is given in a cause, or case, not depending in that court where such judgment is given, or wherein the judge has no jurisdiction.

EXTRAORDINARIJ, amongst the Romans, was a body of men consisting of a third part of the foreign horse and a fifth of the foot, which was separated from the rest of the forces borrowed from the confederate states with great policy and caution, to prevent any design that they might possibly entertain against the natural forces. A more choice body of men were drawn from among the extraordinarij under the name of *ablecti*. See *ABLECTI*.

EXTRAORDINARY, something out of the common course.

EXTRAORDINARY Couriers, are those sent express on some urgent occasion.

EXTRAORDINARY Ambassador, or envoy, is such a one as is sent to treat or negotiate some special and important affair, as a marriage, a treaty, confederacy, &c. or even on occasion of some ceremony, as condolence, congratulation, &c.

A gazette, journal, or other newspaper extraordinary, is that published after some great and notable event, containing the detail or particulars thereof, which are not found in the ordinary papers.

EXTRAVAGANTES, those decretal epistles which were published after the CLEMENTINES.

They were so called, because at first they were not digested or ranged with the other papal constitutions, but seemed to be, as it were, detached from the canon law. They continued to be called by the same name when they were afterwards inserted in the body of the canon law. The first extravagantes are those of John XXII. successor of Clement V. The last collection was brought down to the year 1483, and was called the *common extravagantes*, notwithstanding that they were likewise incorporated with the rest of the canon law.

EXTRAVASATION, in contusions, fissures, depressions, fractures, and other accidents of the cranium, is when one or more of the blood-vessels, that are distributed

Extract
||
Extravasation.

Extreme
||
Exuvia.

distributed in the dura mater, is broken or divided, whereby there is such a discharge of blood as greatly oppresses the brain, and disturbs its office; frequently bringing on violent pains and other mischiefs; and at length death itself, unless the patient is timely relieved. See SURGERY and MEDICINE *Index*.

EXTREME, is applied to the last and outermost part of any thing; or that which finishes and terminates it on that side.

EXTREMES, in *Logic*, denote the two extreme terms of the conclusion of a syllogism; viz. the predicate and subject. They are called *extremes*, from their relation to another term, which is a medium or mean between them. The predicate, as being likewise had in the first proposition, is called the *majus extremum*, greater extreme; and the subject, as being put in the second or minor proposition, is called the *minus extremum*, lesser extreme. Thus, in the syllogism, man is an animal; Peter is a man, therefore Peter is an animal; the word animal is the greater extreme, Peter the less extreme, and man the medium. See SYLLOGISM.

EXTREME and mean proportion, in *Geometry*, is when a line is so divided, that the whole line is to the greater segment, as that segment is to the other: Or, as it is expressed by Euclid, when the line is so divided, that the rectangle under the whole line, and the lesser segment, is equal to the square of the greater segment.

EXTREME Unction. See UNCTION.

EXTREMITIES of figures, in *Painting*, is used for the head, hands, and feet. These should be drawn with more nicety and exactness, or more terminated than other parts; and thus help to render the action more expressive.

EXTRINSIC, among metaphysicians, is taken in various senses. Sometimes it signifies a thing's not belonging to the essence of another; in which sense, the efficient cause and end of a thing are said to be extrinsic. Sometimes it signifies a thing's not being contained within the capacity of another; in which sense, those causes are called extrinsic which introduce something into a subject from without, as when a fire introduces heat. Sometimes it signifies a thing added or applied to another; in which sense accidents and adherents are said to be extrinsic to the subjects to which they adhere. Sometimes the vision is said to be extrinsic from some form which does not exist in that thing, but is adjacent to it, or by some means or other without it.

EXTUBERANCES, in *Medicine*, are swellings or risings up in the flesh or other parts of the body.

EXUBERANCE, (compounded of *ex* and *uber*, "plentiful;") in *Rhetoric*, a redundancy. See REDUNDANCE and PLEONASM.

EXUDATION. See EXSUDATION.

EXVERRÆ, in antiquity, a kind of brush used in cleansing houses out of which a dead person had been carried.

EXULCERATION, in *Medicine*, the act of causing or producing ulcers. Thus, arsenic exulcerates the intestines; corrosive humours exulcerate the skin.

EXULCERATION is sometimes also used for an ulcer itself; but more generally for those beginning erosions which wear away the substance, and form ulcers.

EXUVIÆ, among naturalists, denote the cast off

parts or coverings of animals, as the skins of serpents, caterpillars, and other insects.

Exuvia
||
Eymouth.

EXUVIÆ is also used for some shells and other marine bodies, frequently found in the bowels of the earth; supposed to have been deposited there at the deluge, as being the real spoils of once living creatures. See DELUGE, CONCHOLOGY, and GEOLOGY.

EY, in our old writers, the same with *insula*, "an island;" from which comes *eyet*, a small island or islet, vulgarly called *eyght*.

EYCK. See BRUGES, *John of*.

EYE, in *Anatomy*. See ANATOMY *Index*.

A new born child shall be observed, perhaps, never to keep its eyes fixed on any one object, but continually changing from one to another, and if you put your hand before them, the child will not wink. Hence some have thought, that new-born infants have no sight: but this is a mistake; and the true reason why their eyes are in perpetual motion is, that they have not yet acquired the habit of examining one thing at once with their eyes: their not winking at the approach of the hand, arises from their want of experience how easily their eyes may be hurt; but in a few days they get the habit of winking, so that afterwards their eyes do it spontaneously at the approach of danger.

Artificial eyes are made of concave plates of gold, silver, or glass, and are stained so as to resemble the natural eye. They must, when fixed in the orbit, be taken out and cleaned every night, and replaced in the morning. If no more of a diseased eye is removed than what is preternaturally projected, or if enough is left to preserve the muscles unhurt, the artificial eye will have a little motion from the muscles that remain. If the eye does not fit well, it irritates and inflames the other eye; in which case lay it aside, until one can be had that fits better.

Bull's Eye, in *Astronomy*. See ALDEBARAN.

EYE of a Block, in naval affairs, that part of the rope-strop which is fastened to some necessary place in the ship: the strop is a sort of wreath or rope formed into a ring, and fixed round the block for the double convenience of strengthening the block and fastening it in any place where it is wanted.

EYE, in *Agriculture and Gardening*, signifies a little bud or shoot, inserted into a tree by way of graft. See ENGRAFTING.

EYE of a Tree, a small pointed knot to which the leaves stick, and from which the shoots or sprigs proceed. See GEMMA.

EYE, a town of Suffolk, 22 miles from Ipswich and 91 from London. It may be called an island, because it is surrounded by a brook near the borders of Norfolk, in the road between Ipswich and Norwich. It was incorporated by King John; has two bailiffs, 10 principal burgesses, 24 common council, a recorder, and town clerk. It is a mean-built place, with narrow streets. The chief manufacture is bone-lace and spinning. Here is, however, a large handsome church; and near it are the ruinous walls of an ancient castle and monastery. The market is on Saturday, the fair on Whit-Monday. It has only sent members to parliament since the reign of Edward IV.

EYE-Bright. See EUPHRASIA, BOTANY *Index*.

EYMOUTH, a town of Scotland in the county of Berwick, formerly fortified to curb the garrison of Ber-

Eyrac
||
Ezokiel.

wick, from which place it is distant six miles. W. Long. 1. 50. N. Lat. 55. 50. It gave title of baron in the kingdom of Scotland to Churchill, afterwards the great duke of Marlborough; but he having no male issue, it became extinct in him.

EYRAC, or IRAC, ARABIA, a province of Turkey in Asia, 345 miles in length, and 190 in breadth; of which Bagdad is the capital.

EYRAC *Agemi*, the principal province of Persia, anciently called *Parthia*.

EYRE, or EIRE, in *Law*, the court of itinerant justices. See ASSISE.

EYRIE, in *Falconry*, a brood or nest, a place where hawks build and hatch their young.

EZEKIEL, a canonical book of the Old Testament, referring chiefly to the degenerate manners and corruptions of the Jews of those times. It abounds with fine sentences and rich comparisons, and discovers a good deal of learning in profane matters.

Ezekiel was carried captive to Babylon with Jehoiachin, and began his prophecies in the fifth year of the captivity. He was cotemporary with Jeremiah, who

prophefied at the same time in Judea. He foretold many events, particularly the destruction of the temple, the fatal catastrophe of those who revolted from Babylon to Egypt, and the happy return of the Jews to their own land.

EZION-GABER. See ASIONGABER.

EZRA, a canonical book of the Old Testament; comprehending the history of the Jews from the time of Cyrus's edict for their return, to the 20th year of Artaxerxes Longimanus. It specifies the number of Jews who returned, and Cyrus's proclamation for the rebuilding the temple, together with the laying its foundation, the obstruction it met with, and the finishing thereof in the reign of Darius.

The illustrious author of this book was also the restorer and publisher of the canon of the Old Testament. See BIBLE.

The books of Ezra, called in the English version the *First and Second Book of Esdras*, though held by some, particularly the Greeks, for canonical, are thrown by the English church into the number of apocryphal books, being only extant in Greek.

Ezion-
gaber,
Ezra.

F.

F.

F, THE fourth consonant, and sixth letter of the alphabet. The letter F is borrowed from the digamma or double gamma of the Æolians, as is evident from the inscription on the pedestal of the Colossus at Delos; and was undoubtedly formed from the old Hebrew vau: and though this letter is not found in the modern Greek alphabet, yet it was in the ancient one, from whence the Latins received it and transmitted it to us.

It is formed by a strong expression of the breath, and joining at the same time the upper teeth and under lip. It has but one sort of sound, which has a great affinity with *v* and *ph*, the letter being written for it by us in all Greek words, as *philosophy*, &c. though the Italians write it *filosofia*.

The Romans for some time used an inverted F, Ɔ , instead of V consonant, which had no peculiar figure in their alphabet. Thus, in inscriptions we meet with *TERMINA Ɔ IT, DI Ɔ I*, &c. Lipsius and others say, that it was the emperor Claudius who introduced the use of the inverted digamma, or Ɔ : but it did not long subsist after his death; for Quintilian observes, that it was not used in his time.

F, or FA, in *Musick*, is the fourth note in rising in this order of the gamut, *ut, re, mi, fa*. It likewise denotes one of the Greek keys in music, destined for the bass.

F, in physical prescription stands for *Fiat*, or "Let it be done." Thus *f. s. a.* signifies *fiat secundum artem*.

F, was also a numeral letter signifying 40; according to the verse.

Sexta quaterdenos gerit que distat ab alpha:

And when a dash was added at top, thus F̄ , it signified forty thousand.

F, in the civil law. Two f's joined together thus, *ff*, signify the Pandects. See PANDECTS.

F, in the civil law, a stigma or brand put upon felons with a hot iron, on their being admitted to the benefit of clergy; by stat. 4 Hen. VII. c. 13.

FABA. See VICIA, BOTANY *Index*.

FABAGO, a species of bean-caper. See ZYCO-PHYLLUM, BOTANY *Index*.

FABER. See ZEUS, ICHTHYOLOGY *Index*.

FABIAN, ROBERT, an alderman of the city of London, and sheriff in the year 1494; was a person of learning for the time he lived in, a good poet, and author of a Chronicle of England and France, entitled *The Concordance of Stories*, in two volumes folio, beginning with Brute, and ending with the 20th of Henry VII. 1504. It contains several curious particulars relative to the city of London, not elsewhere to be found. Stow calls it "a painful labour, to the great honour of the city and of the whole realm": We are told that Cardinal Wolsey caused as many copies of this book as he could procure to be burned, because the author had made too clear a discovery of the large revenues of the clergy. Fabian died in 1512.

FABII, a noble and powerful family at Rome, who derived their name from *faba*, a bean, because some of their ancestors cultivated this pulse. They were once so numerous that they took upon themselves to wage

Faba
||
Fabii.

Fabius. a war against the Veientes. They came to a general engagement near the Cremera, in which all the family consisting of 306 men, were totally slain, in the year of Rome 277. There only remained one whose tender age had detained him at Rome, and from him arose the noble Fabii in the following ages.

FABIUS, MAXIMUS RULLIANUS, was first of the Fabii who obtained the surname of *Maximus*, for lessening the power of the populace at elections. He was master of horse: and his victory over the Samnites in that capacity nearly cost him his life, because he engaged the enemy without the command of the dictator. He was five times consul, twice dictator, and once censor. He triumphed over seven different nations in the neighbourhood of Rome, and rendered himself illustrious by his patriotism.

FABIUS Rusticus, an historian in the age of Claudius and Nero. He was intimate with Seneca; and the encomiums which Tacitus passes upon his style, make us regret the loss of his compositions.

Q. FABIUS Maximus, a celebrated Roman, who from a dull and inactive childhood was raised to the highest offices of the state. In his first consulship he obtained a victory over Liguria; and the fatal battle of Thrasymenus occasioned his election to the dictatorship. In this important office he began to oppose Hannibal, not by fighting him in the open field, like his predecessors, but he continually harassed his army by countermarches and ambuscades, from which he received the surname of *Cunctator* or *Delayer*. Hannibal sent him word, "That if he was as great a captain as he would be thought, he ought to come into the plain and give him battle." But Fabius coldly replied, "That if he was as great a captain as he would be thought, he would do well to force him to fight." Such operations for the commander of the Roman armies gave offence to some; and Fabius was even accused of cowardice. He, however, continued firm in his first resolutions; and patiently bore to see his master of horse raised to share the dictatorial dignity with himself by means of his enemies at home. When he had laid down his office of dictator, his successors for a while followed his plan; but the rashness of Varro, and his contempt for the operations of Fabius, occasioned the fatal battle of Cannæ. Tarentum was obliged to surrender to his arms after the battle of Cannæ; and on that occasion the Carthaginian army observed that Fabius was the Hannibal of Rome. When he had made an agreement with Hannibal for the ransom of the captives, which was totally disapproved by the Roman senate, he sold all his estates to pay the money, rather than forfeit his word to the enemy. The bold proposal of young Scipio to go and carry the war from Italy to Africa, was rejected by Fabius as chimerical and dangerous. He did not, however, live to see the success of the Roman arms under Scipio, and the conquest of Carthage by measures which he treated with contempt and heard with indignation. He died in the 100th year of his age, after he had been five times consul, and twice honoured with a triumph. The Romans were so sensible of his great merit and services, that the expences of his funeral were defrayed from the public treasury. His son bore the same name, and showed himself worthy of his noble father's virtues. During his consulship he received a

visit from his father on horseback in the camp. The son ordered his father to dismount; and the old man cheerfully obeyed, embracing his son, and saying, "I wished to know whether you knew what it is to be consul." He died before his father, and Cunctator with the moderation of a philosopher delivered a funeral oration over the dead body of his son.

FABIUS, styled *Pictor*, a Roman general and historian. He first introduced painting at Rome; and having caused the walls of the temple of Health to be painted, some authors have erroneously reckoned him a painter. He died about 216 B. C.

FABLE, a tale, or feigned narration, designed either to instruct or divert, disguised under the allegory of an action, &c.

Fables were the first pieces of wit that made their appearance in the world; and have continued to be highly valued, not only in times of the greatest simplicity, but in the most polite ages of the world. Jotham's fable of the trees is the oldest that is extant, and as beautiful as any that have been made since. Nathan's fable of the poor man is next in antiquity. We find Æsop in the most distant ages of Greece; and in the early days of the Roman commonwealth, we read of a mutiny appeased by the fable of the belly and the members. As fables had their rise in the very infancy of learning, they never flourished more than when learning was at its greatest height; witness Horace, Boileau, and Fontaine.

Fable is the finest way of giving counsel, and most universally pleasing, because least shocking; for, in the reading of a fable, a man thinks he is directing himself, whilst he is following the dictates of another, and consequently is not sensible of that which is the most unpleasant circumstance in advice. Besides, the mind is never so much pleased as when she exerts herself in any action that gives her an idea of her own abilities; this natural pride of the soul is very much gratified in the reading of fable.

FABLE, is also used for the plot of an epic or dramatic poem; and is, according to Aristotle, the principal part, and, as it were, the soul of the poem. See **POETRY.**

FABRI, HONORIUS, a laborious Jesuit born in the diocese of Bellay, distinguished himself by his skill in philosophy and the mathematics, and by writing a great number of books; the most curious of which treat of geometry, optics, the loadstone, the motion of the earth, the ebbing and flowing of the sea, &c. He died at Rome in 1688.

FABRIANO, GENTILE DA, painter of history, was born at Verona in 1332, and became a disciple of Giovanni da Fiesole. In that early age of painting he rendered himself very famous, and was employed to adorn a great number of churches and palaces at Florence, Urbino, Siena, Perugia, and Rome, but particularly in the Vatican; and one picture of his, representing the Virgin and Child, attended by Joseph, which is preserved in the church of S. Maria Maggiore, was highly commended by Michael Angelo. By order of the doge and senate of Venice, he painted a picture in the great council chamber, which was considered as so extraordinary a performance, that his employers granted him a pension for life, and conferred on him the highest honour of their state, which was, the privilege

Fabius
||
Fabriano.

Fabric,
Fabricius.

privilege of wearing the habit of a noble Venetian. He died in 1412.

FABRIC, in general, denotes the structure or construction of any thing; but particularly of buildings, as a church, hall, house, &c. See ARCHITECTURE.

FABRIC Lands, those formerly given towards rebuilding and repairing of cathedrals and other churches; for anciently almost every body gave more or less, by his will, to the fabric of the parish church where he dwelt.

FABRICIUS, C. a celebrated Roman, who in his first consulship, year of Rome 470, obtained several victories over the Samnites and Lucanians, and was honoured with a triumph. The riches which were acquired in those battles were immense, the soldiers were liberally rewarded by the consul, and the treasury was enriched with 400 talents. Two years after, Fabricius went as ambassador to Pyrrhus, and refused with contempt presents, and heard with indignation offers, which might have corrupted the fidelity of a less virtuous citizen. Pyrrhus had occasion to admire the magnanimity of Fabricius; but his astonishment was more powerfully awakened when he saw him make a discovery of the perfidious offers of his physician, who pledged himself to the Roman general for a sum of money to poison his royal master. To this greatness of soul was added the most consummate knowledge of military affairs, and the greatest simplicity of manners. Fabricius never used rich plate at his table. A small salt-cellar, the feet of which were of horn, was the only silver vessel which appeared in his house. This contempt of luxury and useless ornaments Fabricius wished to inspire among the people; and during his censorship he banished from the senate Cornelius Rufinus, who had been twice consul and dictator, because he kept in his house more than ten pounds weight of silver plate. Such were the manners of the conqueror of Pyrrhus, who observed that he wished rather to command those that had money, than possess it himself. He lived and died in the greatest poverty. His body was buried at the public charge, and the Roman people were obliged to give a dowry to his two daughters when they had arrived at years of maturity.

FABRICIUS, George, a learned German, born at Chemnitz in Misnia, in 1516. After a liberal education, he visited Italy in quality of tutor to a young nobleman; and, examining all the remains of antiquity with great accuracy, compared them with their descriptions in Latin writers. The result of these observations was his work entitled *Roma*, containing a description of that city. He afterwards settled at Misenum, where he conducted a great school to the time of his death in 1571. He was also the author of a great number of sacred Latin poems, wrote seven books of the *Annals of Misnia*, three of the *Annals of Meissen*, and *Travels*.

FABRICIUS, Jerom, a celebrated physician in the latter end of the 16th century (surnamed *Aquapendente*, from the place of his birth), was the disciple and successor of Fallopius. He chiefly applied himself to surgery and anatomy, which he professed at Padua for 40 years with extraordinary reputation. The republic of Venice settled a large pension upon him, and honoured him with a gold chain and a statue. He died in 1603;

leaving behind him several works which are much esteemed.

FABRICIUS, John Albert, one of the most learned and laborious men of his age, was born at Leipzig in 1668. He was chosen professor of eloquence at Hamburg in 1699, and was made doctor of divinity at Kiel. His works are numerous; and he died at Hamburg in 1736, after a life spent in the severest literary application to collect and publish valuable remains of ancient learning.

FABRICIUS, Vincent, born at Hamburg in 1613, was a good poet, a great orator, an able physician, and a learned civilian. He was for some time counsellor to the bishop of Lubec, and afterward burgomaster and syndic of the city of Dantzic; from whence he was 13 times sent deputy into Poland, where he died at Warsaw in 1657, during the diet of that kingdom. The most complete edition of Fabricius's poems and other works was published at Leipzig in 1685, under the direction of his son Frederic Fabricius.

FABRICIUS, Baron, one of the finest gentlemen of his time, and known to the public by his letters relating to the transactions of Charles XII. of Sweden during his residence in the Ottoman empire, was descended from a good family in Germany. He was taken early into the service of the court of Holstein; and was sent in a public character to the king of Sweden whilst he was at Bender; where he soon acquired the good graces of that prince. He accompanied him in his exercises; gave him a turn for reading; and it was out of his hand Charles snatched Boileau's satires, when he tore out those that represented Alexander the Great as a madman. Fabricius was also in favour with Stanislaus, and with our King George I. whom he accompanied in his last journey to Hanover, and was with him when he died. A translation of his letters was published in London 1761.

FABROT, CHARLES HANNIBAL, one of the most celebrated civilians of his time, was born at Aix in 1681; and acquired an extraordinary skill in the civil and canon law, and in the belles lettres. He published the *Basilicæ*, or Constitutions of the Emperors of the East, in Greek and Latin, with learned notes, in seven vols. folio; and editions of *Cedrenus*, *Nicetas*, *Anastasius Bibliothecarius*, *Constantine Manasses*, and *Cujas*, with learned and curious notes.

FABULOUS, something consisting of, or connected with, a fable.

FABULOUS Age, among ancient historians. See AGE.

FACE, the surface, or first side which a body presents to the eye. We say, the *face* of the earth, of the waters, &c. Polyhedrons have several *faces*. A die, or cube, has six *faces*.

FACE, is particularly used for the visage of an animal, and especially of man; and comprehends, in the latter, all that part of the head which is not covered with the common long hair. The Latins call it *facies*, *vultus*, or, &c.

The human face is called the *image of the soul*, as being the seat of the principal organs of sense; and the place where the ideas, emotions, &c. of the soul are chiefly set to view. Pride and disdain are shown in the eyebrows, modesty on the cheeks, majesty in the forehead,

Fabricius
||
Face.

Face
||
Factor.

head, &c. It is the face shows the sex, age, temperament, health, or disease, &c.

The face, considered as the index of the passions, habits, &c. of the person, makes the subject of physiognomy. See **PHYSIOGNOMY**.

FACE, among painters and artists, is used to denote a certain dimension of the human body, adopted for determining the proportion which the several parts should bear to one another. See **DRAWING**.

FACE, in the military art, a word of command, intimating to turn about: thus, *face to the right*, is to turn upon the left heel a quarter-round to the right; and, *face to the left*, is to turn upon the right heel a quarter-round to the left.

FACIES HIPPOCRATICA, in *Medicine*, is when the nostrils are sharp, the eyes hollow, the temples low, the tips of the ears contracted and cold, the forehead dry and wrinkled, and the complexion pale or livid.—The Hippocratic face is chiefly observed towards the period of phthisis and other consumptions, and is held a sure prognostic of death. If it appears within three days after the attack of an acute disease, it is deemed to indicate death.

FACIION, a cabal or party formed in a state, city, or company.

FACIION, in antiquity, a name given to the different companies of combatants in the circus. They were four, viz. the white, the red, the green, and the blue; to which Domitian added another of purple colour. They were so denominated from the colour of the liveries they wore; and were dedicated, according to M. Aur. Cassiodorus, to the four seasons of the year; the green being consecrated to spring, the blue to winter, the red to summer, and the white to autumn. It appears from ancient inscriptions, that each faction had its procurators and physician; and from history, that party rage ran so high among them, that in a dissension between two factions, in the time of Justinian, almost 40,000 men lost their lives in the quarrel.

FACTITIOUS, any thing made by art, in opposition to what is the produce of nature. Thus, factitious cinnabar is opposed to native cinnabar.

FACTOR, in commerce, is an agent employed by merchants residing at other places, to buy or sell goods, or negotiate bills, or transact any kind of business on their account; and entitled to a certain allowance for his trouble.

A supercargo differs from a factor in this: The business of the former is limited to the care of a particular cargo; he goes along with it, and generally returns when his business is completed: the latter has a fixed residence abroad, and executes business for different merchants. But their duties, and the circumstances for which they are accountable, are the same.

The duty of a factor is to procure the best intelligence of the state of trade at his place of residence; of the course of exchange; of the quantity and quality of goods at market, their present price, and the probability that it may rise or fall: to pay exact obedience to the orders of his employers; to consult their advantage in matters referred to his direction; to execute their business with all the despatch that circumstances admit; to be early in his intelligence, distinct in his accounts, and punctual in his correspondence.

A factor's power is either absolute or limited. Tho'

intrusted with ample discretionary powers, he is not warranted to take unreasonable or unusual measures, or do any thing contrary to his employer's interest; but it is incumbent on the employer, if he challenge his proceedings, to prove that he could have done better, and was guilty of wilful mismanagement.

When a factor's power is limited, he must adhere strictly to his orders. If he exceeds his power, though with a view to his employer's interest, he is liable for the consequence. For example, if he gives credit when not empowered, or longer credit if not empowered, for the sake of a better price, and the buyer proves insolvent, he is liable for the debt. A factor has no power to give credit unless authorized: But if the goods consigned be generally sold on credit at the place of consignment, the factor will be vindicated for selling at the usual credit, unless expressly restricted.

Although opinion will never justify the factor for departing from orders, necessity sometimes will. If he be limited not to sell goods under a certain price, and the goods be perishable, and not in a situation for being kept, he may sell them, to prevent their destruction, even under the price limited.

A factor is never warranted to deal on trust, except with persons in good credit at the time. If the employer challenge the debtors, it is incumbent on him to prove that their bad circumstances were known at the time of sale; and the factor will be vindicated, if he trusted them at the same time for goods of his own.

If the factor sells his employer's goods on trust, and, after the day of payment is elapsed, receive payment from the purchaser for a debt of his own, he becomes liable in equity for the debt.

In case of bankruptcy, the factor ought immediately to lay attachments, and advise his employers; and he cannot withdraw his attachments, nor compound debts, without orders.

If a factor sells goods belonging to different merchants to the same person, and the buyer proves insolvent, they shall bear the loss in equal proportions; and, if the buyer has paid part before his insolvency, without specifying for which, the payment ought to be distributed in equal proportions; but, if the days of payment be fixed, and part of the debts only due, the payment ought to be applied, in the first place, to such debts as were due.

If he makes a wrong entry at the custom-house, and the goods be seized in consequence thereof, he must bear the loss, unless the error be occasioned by a mistake in the invoice, or letter of advice.

The owner bears the loss of goods seized when attempted to be smuggled by his orders; but the factor complying with an unlawful order is liable in such penalties as the laws exact.

If a factor saves the duty of goods due to a foreign prince, he shall have the benefit; for, if detected, he bears the loss.

If a factor sells goods bought by his employer's orders for his own advantage, the employer may recover the benefit, and the factor shall be amerced for the same.

If a factor receives bad money in payment, he bears the loss; but if the value of the money be lessened by the government, the employer bears the loss.

Factor.

Factor
||
Faculty.

A factor is not liable for goods spoiled, robbed, or destroyed by fire.

If a factor receives counterfeit jewels from his employer, and sells them, the employer is liable to indemnify him for any penalties he may incur.

If a factor be ordered to make insurance, and neglect it, and the subject be lost, he is liable to make it good, providing he had effects in his hands.

If a factor buys goods for his employer, his bargain shall be binding on the employer.

In case of a factor's insolvency, the owner may reclaim his goods; and, if they be sold on trust, the owner (and not the factor's creditors) shall recover payment of the debts.

FACTOR, in multiplication, a name given to the multiplier and multiplicand, because they constitute the product. See ARITHMETIC.

FACTORAGE, called also *commission*, is the allowance given to factors by the merchant who employs them.

A factor's commission in Britain, on most kinds of goods, is $2\frac{1}{2}$ per cent.; on lead, and some other articles, 2 per cent.; in Italy, $2\frac{1}{2}$ per cent.; in France, Holland, Spain, Portugal, Hamburgh, and Dantzic, 2 per cent.: in Turkey, 3 per cent.; in North America, 5 per cent. on sales, and 5 per cent. on returns; in the West Indies, 8 per cent. for commission and storage. In some places, it is customary for the factors to ensure the debts for an additional allowance, generally $1\frac{1}{2}$ per cent. In that case, they are accountable for the debt when the usual term of credit is expired.

Factorage on goods is sometimes charged at a certain rate per cask, or other package, measure, or weight, especially when the factor is only employed to receive or deliver them.

FACTORY is a place where a considerable number of factors reside, to negotiate for their masters or employers. See FACTOR.

The most considerable factories belonging to the British are those established in the East Indies, Portugal, Turkey, &c. There are also English factories established at Hamburgh, Petersburg, Dantzic, and in Holland; all endowed with certain privileges.

FACTUM, in *Arithmetic*, the product of two quantities multiplied by each other.

FACULÆ, in *Astronomy*, certain bright and shining parts, which the modern astronomers have, by means of telescopes, observed upon or about the surface of the sun; they are but very seldom seen.—The word is pure Latin; being a diminutive of *fax*, "torch;" and supposed to be here applied from their appearing and disappearing by turns.

FACULTY, in *Law*, a privilege granted to a person, by favour and indulgence, of doing what, by law, he ought not to do.

For granting these privileges, there is a court under the archbishop of Canterbury, called the *court of the faculties*. The chief officer of this court is styled *master of the faculties*, and has a power of granting dispensations in divers cases: as to marry without the bans being first published, to eat flesh on days prohibited, to ordain a deacon under age, for a son to succeed his father in his benefice, a clerk to hold two or more livings, &c.

FACULTY, in the schools, a term applied to the dif-

ferent members of an university, divided according to the arts and sciences taught there: thus in most universities there are four faculties, viz. 1. Of arts, which include humanity and philosophy. 2. Of theology. 3. Of physic. And, 4. Of civil law.

FACULTY of Advocates. See ADVOCATES.

FACULTY is also used to denote the powers of the human mind, viz. understanding, will, memory, and imagination. See METAPHYSICS.

FÆCES, in *Chemistry*, the gross matter, or sediment, that settles at the bottom after distillation, fermentation, and the like.—The fæces of wine are commonly called LEES.

FÆCES, in *Medicine*, the excrements voided by stool. See EXCREMENTS.

FÆCULENT, in general, is applied to things abounding with fæces or dregs: thus the blood and other humours of the human body are said to be fæculent, when without that purity which is necessary to health.

FAENSA, a city and bishop's see of Italy, situated in the pope's territories, about 30 miles east of Bologna: E. Long. 12. 38. and N. Lat. 44. 30.

FAENZA, a city of Romagna in Italy with a bishop's see. It is an ancient place, and has undergone various revolutions. The river Amona washes its walls, and passes between the city and the suburbs, which are joined by a stone bridge defended by two good towers. The city is remarkable for its earthen ware, which is the best in all Italy.

FAERNUS, GABRIEL, a native of Cremona in Italy, was an excellent Latin poet and critic of the 16th century. He was so skilled in all parts of polite literature, that the cardinal de Medicis, afterward Pope Pius IV. was particularly fond of him. He was the author of some Latin elegies; of 100 Latin fables, selected from the ancients, written in iambic verse; and of several pieces of criticism, as *Censura emendationum Livianarum*, *De Metris Comicis*, &c. He was remarkably happy in decyphering manuscripts, and restoring ancient authors to their purity: he took such pains with Terence in particular, that Bentley has adopted all his notes in the edition he gave of that writer. He died at Rome in 1561; and Thuanus, who wrote his eloge, says that the learned world was greatly obliged to him; yet had been still more so, if, instead of suppressing the then unknown fables of Phædrus, for fear of lessening the value of his own Latin fables, written in imitation of Æsop, he had been content with imitating them. M. Perrault, however, who translated Faernus's fables into French, has defended him from this imputation, by affirming that the first MS. of Phædrus's fables, found in the dust of an old library, was not discovered till about 30 years after Faernus's death.

FAGARA, IRON WOOD: a genus of plants belonging to the tetrandria class, and in the natural method ranking under the 43d order, *Dumosee*. See BOTANY Index.

FAGE, RAYMOND DE LA, an excellent designer and engraver, highly esteemed by Carlo Maratti, was born at Toulouse in 1648. He applied himself to designing, through inclination, in spite of his parents; and had no master nor any assistance: but his superior talents supplied the want of them, and he became one of the best designers in Europe; his performances on licentious

Faculty
||
Page.

Faggot
||
Fagus.

centious subjects are the most esteemed. It is reported of this artist, that he never made use of money, but contracted debts; and when the accounts were brought him, he made some design upon the back of the bills, and bid the owners sell the drawings to connoisseurs for the amount, by which they were generally great gainers. Several of those drawings are yet in the cabinets of the curious. He led a loose, depraved life; and his repeated debaucheries put an end to it at the age of 42.

FAGGOT, in times of Popery here, was a badge worn on the sleeve of the upper garment of such persons as had recanted or abjured what was then termed *heresy*; being put on after the person had carried a faggot, by way of penance, to some appointed place of solemnity. The leaving off the wear of this badge was sometimes interpreted a sign of apostasy.

FAGGOTS, among military men, persons hired by officers, whose companies are not full, to muster and hide the deficiencies of the company; by which means they cheat the king of so much money.

FAGIUS, PAUL, *alias* BUCHLIN, a learned Protestant minister, born at Rheinabem in Germany in 1504. He was a schoolmaster at Ilna; but afterwards became a zealous preacher, and wrote many books. The persecution in Germany menacing danger to all who did not profess the Romish doctrines, he and Bucer came over to England in 1549, at the invitation of Archbishop Cranmer, to perfect a new translation of the Scriptures. Fagius took the Old Testament, and Bucer the New, for their respective parts; but the design was at that time frustrated by the sudden deaths of both. Fagius died in 1550, and Bucer did not live above a year after. Their bodies were dug up and burned in the reign of Queen Mary.

FAGONIA, a genus of plants belonging to the decandria class, and in the natural method ranking under the 14th order, *Grinales*. See *BOTANY Index*.

FAGOPYRUM, or BUCK WHEAT. See *POLYGONUM*, *BOTANY Index*.

FAGUS, the BEECH TREE; a genus of plants belonging to the monocia class, and in the natural method ranking under the 50th order, *Amentaceæ*. See *BOTANY Index*.

The *chestnut tree*, one of the species belonging to this genus, sometimes grows to an immense size. The largest in the known world are those which grow upon Mount *Ætna* in Sicily. At Tortworth in Gloucestershire, is a chestnut tree 52 feet round. It is proved to have stood there ever since the year 1150, and was then so remarkable that it was called the *great chestnut of Tortworth*. It fixes the boundary of the manor, and is probably near 1000 years old. As an ornamental, the chestnut, though unequal to the oak, the beech, and the esculus, has a degree of greatness belonging to it which recommends it strongly to the gardener's attention. Its uses have been highly extolled; and it may deserve a considerable share of the praise which has been given it. As a substitute for the oak, it is preferable to the elm: For door-jamb, window-frames, and some other purposes of the house carpenter, it is nearly equal to oak itself; but it is very apt to be shakey, and there is a deceitful brittleness in it which renders it unsafe to be used as beams, or in any other situation where an uncertain load is required to be borne. It is universally allowed to be excellent for

liquor casks; as not being liable to shrink nor to change the colour of the liquor it contains: it is also strongly recommended as an underwood for hop-poles, stakes, &c. Its fruit too is valuable, not only for swine and deer, but as a human food: Bread is said to have been made of it. Upon the whole, the chestnut, whether in the light of ornament or use, is undoubtedly an object of the planter's notice.

FAINT ACTION, in *Law*, a feigned action, or such as, although the words of the writ are true, yet for certain causes, the plaintiff has no title to recover thereby.

FAINT Pleader, in *Law*, a covinous, false, or collofory manner of pleading, to the deceit of a third person.

FAINTING. See *LIPOTHYMIA*.

FAINTS, in the distillery, the weak spirituous liquor that runs from the still in rectifying the low wines after the proof-spirit is taken off.

FAINTS are also the last runnings of all distilled spirits. The clearing the worm of these is so essential a point in order to the obtaining a pure spirit by the subsequent distillation, that all others are fruitless without it.

FAIR, a greater kind of market, granted to a town, by privilege, for the more speedy and commodious providing of such things as the place stands in need of.

The word fair, is formed from the French *foire*, which signifies the same thing; and *foire* is by some derived from the Latin *forum*, "market;" by others from the Latin *feriæ*, because anciently fairs were always held in the places where the wakes, or feasts of the dedications of churches, called *feriæ*, were held. See *FERIÆ*.

It is incident to a fair, that persons shall be free from being arrested in it for any other debt or contract than what was contracted in the same; or, at least, promised to be paid there. These fairs are generally kept once or twice a-year: and, by statute, they shall not be held longer than they ought by the lords thereof, on pain of their being seized into the king's hands, &c. Also proclamation is to be made, how long they are to continue; and no person shall sell any goods after the time of the fair is ended, on forfeiture of double the value, one fourth to the prosecutor and the rest to the king. There is a toll usually paid in fairs on the sale of things, and for stallage, picage, &c.

Fairs abroad are either free, or charged with toll and impost. The privileges of free fairs consist chiefly, first, in that all traders, &c. whether natives or foreigners, are allowed to enter the kingdom, and are under the royal protection, exempt from duties, impositions, tolls, &c. Secondly, that merchants, in going or returning, cannot be molested or arrested, or their goods stopped. They are established by letters-patent from the prince. Fairs, particularly free fairs, make a very considerable article in the commerce of Europe, especially that of the Mediterranean, and inland parts of Germany, &c.

The most celebrated fairs in Europe are those, 1. Of Francfort, held twice a-year, in spring and autumn: the first commencing the Sunday before Palm-Sunday, and the other on the Sunday before the eighth of September. Each lasts 14 days, or two weeks; the first of which is called the *week of acceptance*,

Faint
||
Fair.

Fair.

ance, and the second the *week of payment*. They are famous for the sale of all kinds of commodities; but particularly for the immense quantity of curious books nowhere else to be found, and whence the booksellers throughout all Europe used to furnish themselves. Before each fair, there is a catalogue of all the books to be sold thereat, printed and dispersed, to call together purchasers: though the learned complain of divers unfair practices therein; as fictitious titles, names of books purely imaginary, &c. beside great faults in the names of the authors, and the titles of the real books. —2. The fairs of Leipzig, which are held thrice a year; one beginning on the first of January; another three weeks after Easter; and a third after Michaelmas. They hold 12 days a-piece; and are at least as considerable as those of Francfort. 3. The fairs of Novi, a little city in the Milanese, under the dominion of the republic of Genoa. There are four in the year, commencing on the second of February, the second of May, the first of August, and second of September. Though the commodities bought and sold here be very considerable; yet, what chiefly contributes to render them so famous, is the vast concourse of the most considerable merchants and negotiators of the neighbouring kingdoms, for the transacting of affairs and settling accounts. 4. The fairs of Riga, whereof there are two in the year; one in May, and the other in September. They are much frequented by the English, Dutch, and French ships, as also from all parts of the Baltic. The best time for the sale of goods at Riga is during the fairs. Since the building of the famous city of Petersburg, these fairs have suffered some diminution. 5. Fair of Archangel, during which all the trade foreigners have with that city is managed. It holds a month, or six weeks at most, commencing from the middle of August. The Muscovite merchants attend here from all parts of that vast empire; and the English, Dutch, French, Swedish, Danish, and other ships in the port of that city, on this occasion, ordinarily amount to 300. But this is no free fair as the rest are: The duties of exportation and importation are very strictly paid, and on a very high footing. 6. The fair of St Germain, one of the suburbs of Paris, commencing on the third of February, and holding till Easter; though it is only free for the first 15 days. 7. The fairs of Lyons, which Monf. du Chefne, in his antiquity of cities, would insinuate, from a passage in Strabo, were established by the Romans; though it is certain, the fairs, as they now stand, are of a much later date. There are three in the year, each lasting 20 days, and free for ever. They begin on Easter Monday, the 26th of July, and the first of December. 8. Fair of Guibray, a suburb of the city of Falaise, in the Lower Normandy. It is said to have been established by our William the Conqueror, in consideration of his being born at Falaise. It commences on the 16th of August; and holds 15 days free by charter, and longer by custom. 9. Fair of Beaucaire, held partly in a city of that name, in Languedoc, and partly in the open country, under tents, &c. It commences on the 22d of July, and only holds for three days; yet it is the greatest and most celebrated of all the fairs in that part of Europe, both for the concourse of strangers from all parts of the world, and for the traffic of all kinds of goods: the money return-

ed in these three days amounting sometimes to above six millions of livres. Fair.

The fairs of Porto-Bello, Vera Cruz, and the Havannah, are the most considerable of all those in America. The two first last as long as the flota and galleons continue in those ports; and the last is opened as soon as the flota or galleons arrive there upon their return for Spain; this being the place where the two fleets join. See FLOTA and GALLEONS.

The principal British fairs are, 1. Sturbridge fair, near Cambridge, by far the greatest in Britain, and perhaps in the world. 2. Bristol has two fairs, very near as great as that of Sturbridge. 3. Exeter. 4. West Chester. 5. Edinburgh. 6. Wkeyhill; and, 7. Burford fair; both for sheep. 8. Pancras fair, in Staffordshire, for saddle-horses. 9. Bartholomew fair, at London, for lean and Welsh black cattle. 10. St Faith's, in Norfolk, for Scotch runts. 11. Yarmouth fishing fair for herrings; the only fishing fair in Great Britain. 12. Ipswich butter fair. 13. Woodborough-hill, in Dorsetshire, for west country manufactures, as kerseys, druggits, &c. 14. Two cheese fairs at Chipping Norton: with innumerable other fairs, besides weekly markets, for all sorts of goods, as well our own as of foreign growth.

FAIR, in sea-language, is used for the disposition of the wind, when it is favourable to a ship's course, in opposition to that which is contrary or foul. The term *fair* is more comprehensive than *large*, and includes about 16 or 18 points of the compass; whereas *large* is confined to the beam or quarter, that is, to a wind which crosses the keel at right angles, or obliquely from the stern, but never to one right a-stern.

FAIR Isle, a small island lying between Orkney and Shetland, 10 or 12 leagues E. N. E. from the former; and seven, eight, or 10 leagues S. W. from the latter. It is three miles long, and scarcely half a mile broad, very craggy, with three high rocks which are visible both from Orkney and Shetland. It contains a small quantity of arable land, which is very fruitful and well manured; excellent pasturage for sheep; and affords great plenty of sea and water fowl, and all kinds of fish upon the coasts. There is in effect no port, though they have two that are nominally so: one at the south end, which is full of rocks, where only small boats can lie; the other at the north-east end, larger and safer in summer, so that it serves commodiously enough for their fishery. The duke of Medina Sidonia, when commander of the famous Spanish armada in 1588, was wrecked on the east coast of this island. The ship broke to pieces, but the duke and 200 made their escape. They lived here so long, that both they and the inhabitants were almost famished. At length the duke and the poor remains of his people were carried over to the main land of Shetland, and then to Dunkirk, by one Andrew Humphry, for which service Andrew was rewarded with 3000 merks. This island produced to its former proprietor between 50l. and 60 sterling. It was sold at Edinburgh in 1766, for about 850l. to James Stewart of Burgh, Esq.

FAIR-curve, is a winding line, used in delineating ships, whose shape is varied, according to the part of the ship which it is intended to describe.

FAIR-way, in sea language, the path or channel of a narrow bay, river, or haven, in which ships usually advance

