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ORGAN ("Organo, Gr. ὀργανόν, Lat. instrumentum), thenoblesst of musical instruments, whether considered in regard to the grandeur and beauty of its sounds, the variety of its powers, or the sacred purposes to which it is usually dedicated. It consists of a vast number of metallic and wooden pipes, divided into different stops, and being admitted into the pipes from a bellows, and is played on by means of a key-board. The machinery of an organ, which is vast and complex and exceedingly curious, has been described in the preceding article.

Originally the word organum had a very extensive meaning, and signified nearly every kind of instrument, for whatever purpose employed. By degrees it was confined to instruments of music; afterwards it was applied only to those of the pneumatic, or wind, kind; and finally it was exclusively used to designate that "world of sounds" which we call the Organ. It can hardly be doubted that this instrument may be traced to Pan's-pipes, or the Syrinx. It must soon have been discovered that the air might be forced into a closed cavity, and then distributed at will to one or more tubes; and pursuing the continuance a little further, something like a modern organ was likely to be produced. Indeed Mersenne, in his Harmonie Universelle, mentions an ancient monument in the Mattei Gardens in Rome, on which appears the representation of a pneumatic organ. It is a small chest placed on a table. In the front is a female figure playing on a number of keys, and on the other side is a man blowing into the box with a pair of bellows exactly like those in present use. In Hawkins's History (i. 463) is an engraving of this, from a copy found among the papers of Haym, the author of a history of ancient medallions. St. Augustine, in his Comments on the 56th Psalm, alludes to instruments inflated by bellows. In the same passage he also gives us to understand that organ was a generic term, including every species. 'Organum,' he says, 'decutur omnium instrumentum musicorum,' &c.

The descriptions left us by different authors of the musical instruments of the early part of the middle ages, and the representations of them on several monuments, prove that attempts were made at several periods to improve them. Much thought was expended in discovering the best method of introducing air into the pipes of their organ. For this purpose a fall of water was employed, and also what must be understood to have been steam. William of Malmsbury describes the manner in which the latter was used. He says, 'The wind, being forced out by the violence of the hot water, fills the whole cavity of the instrument, which, from several apertures, passing through brass pipes, sends forth musical noises.' At length bellows were employed for the purpose, which were either worked by water or by hand. The application of these two powers led to the distinguishing terms hydraulic and pneumatic, or water-organ and wind-organ; though, in point of fact, the ultimate result was the same in both. The inventor of the former, which historians call an hydraulic organ, is ascribed to Ctesibius of Alexandria, who lived about B.C. 150-120. [CRISANUS] Virrarius is the first writer who gives any account of an organ of that kind.

The period when the organ was introduced into the churches of Western Europe is very uncertain. Pope Vitalian is supposed to have been the first to admit the instrument, about the year 670; but the earliest account to be at all relied on, of the introduction of this instrument in the West, is, that about the year 753 the Greek emperor Copronymus sent one as a present to Pepin, king of France. In the time of Charlemagne however organs became common in Europe. That prince had the builder Matthew Chapelle, in 812, on a Greek model, which the learned Benedicte, Bedos de Celles, in his vast but useful and excellent work, L'Art du Facteur des Orgues (1766), considers to have been the first that was furnished with bellows, without the use of water.

Before the tenth century organs were not only common in England, but exceeded, both in size and compass, those of the Continent. St. Dunstan gave one to the abbey of Malmsbury, in the reign of Edgar. Eligor, bishop of Winchester, obtained one for his cathedral in 993, which was the largest then known. This is described, in eight Latin verses, by Wolstan, the learned monk of Winchester, in the tenth century, of which Mason, the poet, in his Essay on Instrumental Church Music, gives the following translation:

'Twelve pair of bellows, rang'd in stated row,
Are joined above, and fourteen more below.
Those that fill the force of seventy men require;
Who careless toil, and piously aspire;
Each adding each, till all the wind be prest.
In the close confines of th' incumbent chest,
On which four hundred pipes in order rise,
To bellow forth that blast the chest supplies.'

The translator adds an explanation by no means unnecessary: 'We are not,' he says, 'I think, to imagine that these stately bellows blew their bellows in action all the time the organist was playing. I rather think that his performance did not commence till they had filled the chest completely with wind, which he was afterwards to expend by due degrees, as he found occasion.'

The organ was at first very rude in its construction, and extremely limited in its means. The keys were four or five inches broad, and must have been struck by the clenched hand, in the manner of thearrantias: the pipes were of brass, harsh in sound, and the compass did not exceed a dozen or fifteen notes in the twelfth century; and to accompany the plain-chant, no more were required. About that time half notes were introduced at Venice, where also the important addition of pedals, or foot-keys, was first made in 1476, by Bernhard, a German, to whose countrymen we owe many improvements of the instrument; though in excellence of finish they have been surpassed by our English builders.

Few particulars are recorded concerning the organs of this country, from the Reformation to the time of Charles I. Camden mentions one at Wrexham, and Fuller has been strangely misguided in describing it to have had pipes of gold. It shared the general fate of organs in 1641; and the old York organ, lately replaced by a new instrument, was one of those bellows organs that escaped the organoclasts of those times. At the Restoration, however, four organ-builders of eminence survived, a circumstance which led to the introduction of foreign artists,—of Bernard Schmidt (commonly called Father Smith), and his two nephews, with the elder Harris, and his son Renatus. An account of the dispute between these two family parties is amusingly related in Burney's Hist. ii., 437. Each...
erected an organ in the Temple church, as a trial of ability: Blow and Purcell displayed Smith's, and Mons. Lully (not the great composer) that of the Harris's. The lord chancellor Jeffries at length decided in favour of Smith. The principal organs of the latter are— the Temple; Christ Church and St. Mary's, Oxford; Trinity College, Cambridge; St. Margaret's, Westminster; St. Clement's Dane's, Southwark Minster; Trinity Church, Hulst; and St. Paul's Cathedral. Harris's organ, after being rejected by the Temple committee, was erected in the church of St. Andrew's, Holborn, and part in Christian Church, Dublin. This last portion was afterwards removed to Wolverhampton. His other principal instruments are those at St. Mary-Axe; St. Bride's; St. Lawrence, Cheapside; and an organ at Trinity Church. However, on his last remaining calls, was commissioned to make twice as many organs as his competitor. The Spectator, No. 552, says that he was ambitious of building an organ for the metropolitan cathedral. We have however no reason to regret this, it was so well done. To these celebrated mechanics succeeded Schreiber, Smith's son-in-law, who built the organ in Westminster Abbey, and that at St. Martin's-in-the-Fields, the latter a present from George I. as churchwarden; Snetzler, Byfield, &c.; and at a later period, Green; Avery, who most successfully imitated Smith; Gray, Elliott, &c.

The tone of the pipes of the old builders—depending on what is technically called the voicing—has never been excelled by later makers; but in point of touch, and mechanism generally, the present generation are far their father's equals, and their successors. In mechanical skill and delicate finishing the English organ-builders far surpass their continental rivals, while in tone they at least equal them; but the costliness of our materials and high rate of wages render the organs of this country much more expensive, a matter which may be of little moment, or even of France; though the profits of the builders do not bear the same proportion to their prices that is thought reasonable in most other manufactories. It has been truly observed, that 'notwithstanding the imposing enumeration of so many organs, the large organs of the Continent are inferior in the choice and variety of them to the best English instruments; a part being in fact but half-stops, and several only absurd imitations of other musical instruments, and really worthy of a scientific investigation.'

The following is a list of some of the largest and most celebrated foreign organs, from Croose's Account of the York Festival, 1823, 'collected,' he says, 'from many sources. and enriched with some additions communicated by the Rev. C. I. Laborte.'

<table>
<thead>
<tr>
<th>City</th>
<th>Pipe Stops</th>
<th>Pipes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seville cathedral</td>
<td>100</td>
<td>5300</td>
</tr>
<tr>
<td>Goerlitz, in Upper Lusatia</td>
<td>96</td>
<td>2920</td>
</tr>
<tr>
<td>Hamburg, St. Michael's</td>
<td>57</td>
<td>109</td>
</tr>
<tr>
<td>Amsterdam, the old church</td>
<td>64</td>
<td>9666</td>
</tr>
<tr>
<td>Weissenburg, a Benedictine monastery in Suabia</td>
<td>60</td>
<td>5000</td>
</tr>
<tr>
<td>Tours cathedral</td>
<td>60</td>
<td>5000</td>
</tr>
<tr>
<td>Haarlem</td>
<td>50</td>
<td>5000</td>
</tr>
<tr>
<td>(of these are 16 feet, and 5 of 32': the greatest diameter being 15 inches. It is 10 feet high, and 50 broad.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alost</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Berlin, St. Peter's</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Vienna, St. Michael's</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Rome, St. John Lateran</td>
<td>42</td>
<td>2925</td>
</tr>
<tr>
<td>Baltimore, in America</td>
<td>36</td>
<td>2214</td>
</tr>
</tbody>
</table>

Mr. (now Sir John) Barrow, in his 'Tour' (1830), mentions a new organ erected in the church of St. Lawrence, in Rotterdam, containing 5500 pipes, which, according to his calculation, is 130 feet in height.

Our English church-organs are numerous, and generally well supported. Though we have not Containing so many nominal stops as a few on the continent can boast, yet we possess some which, in regard to the greater calibre of the pipes, and power of every kind, surpass any foreign instrument. Chief among these are the new organ in York Cathedral, and that in the town-hall of Birmingham.

The York organ, built by Elliot and Hill, contains 56 stops all through, besides 6 copula stops. The number of pipes is 4200. The largest metal pipe is 29 feet in length and 20 inches in diameter; the largest wooden pipe is 22 feet long, 3 wide, and 2½ deep. This, the builder

boats, would contain twelve pipes and two gallons of wine. Both pipes give c, three octaves below the second space in the base. It has 3 rows of keys, and 2 octaves of pedals. The width of this instrument is 70 feet, and its height in proportion. The old York organ, burnt in 1740, was the largest in the kingdom; it had 3224 pipes distributed among 57 stops.

The Birmingham organ, built by Hill and completed in 1823, in regard to size and power, the rival of that in York, though the latter is considerably older. It contains 6400 pipes. This is 35 feet wide, 15 deep, and 45 high. The swell box alone is the size of a moderately large church-organ. It has 40 real stops, about 3000 pipes, 4 rows of keys, and 2 octaves of pedals. The largest metal pipe is 35 feet long, and 21 inches in diameter, for the bass, or the middle of this instrument, are of zinc only. The weight of the whole is about 40 tons.

The organ in St. Paul's cathedral contains 1797 pipes, divided into 58 stops; 3 rows of, and the largest pipe is 22 inches in diameter. That in Westminster Abbey has 28 stops, and 1524 pipes: 3 rows of keys, and double divisions for the pedals. At Exeter is an organ, built by John Loosenson, in 1666; its largest pipes rises only to 23 feet, and contains the same number, with 3 rows of keys, built by Messrs. Greenwood of that place. The new church of St. Luke, Chelsea, has been provided with an organ, made by Nicholass, containing 33 stops and 1800 pipes. It was designed by T. St. John, of St. Paul's Church, which contains 2500 pipes divided into 40 stops; though when that at Christ's Hospital (made by Hill) is finished, it will be much superior, in number of pipes and power, to any in the metropolis. The largest organ in 23 stops, and 1500 pipes, is taken in that of the ships of the Spanish Armada, and presented to that cathedral by queen Elizabeth.

The Barrels-Organ is an instrument by which most of the effects of a small key-organ are produced by certain maestros. All the keys of the fingers, the keys, or the pedals, as they may be called, are inside the organ, and acted on by means of a cylinder, or barrel, pinned, or attached, in a particular and singularly curious manner. This barrel is made to revolve by a wheel, and in those of an expensive kind by wheels surmounted by a spring.

The Apollonicon is an instrument which combines in itself the keyed and barrel organ, and which has delighted and astonished all who have heard it. The Apollonicon to which we allude, will, we fear, to be removed from the scene of its isolation for ever, or 'resurrected' into its element.

As some description of it may hereafter be found useful, as a part of musical-mechanical history, we refer the reader to the article APOLLONICON, and to the Harmonicon (ix. 9).

Mr. L'Eveque du Facteur d'Orgues, Hewitt; Croose's York Festival; Mullin; Harmonicon)

ORGANON. It is not possible to give a definition of any science which shall convey its full import, and particularly to a person who does not already know what it is. This difficulty will be experienced by any one who attempts to give a definition of Logic. Without then attempting a definition, or admitting the completeness or correctness of any definition hitherto given, it may be sufficient, for the purpose of showing what that matter is about which we are desiring to express, to make the distinction that logic is distinct from, and separate from the formal laws of thought, and that it is not conversant about the matter which is subjected to such laws.

This thing, whatever it may be, about which logic is conversant, is presented to us, and is generally expressed by a language. Whatever are the conceptions of the mind which are involved or contained in the exercise of thought, those operations may be generally expressed by language. It is assumed here, that by whatever names we designate the notion of the particular idea, or any conception of ideas which pass through the mind, this relation is in all minds essentially the same. When two persons then possess a common language, one of them can express in this language, with a certain degree of accuracy, the various conceptions and connected ideas which both have passed through their mind with respect to any matter or subject. Another person, who, to use the common expres-
mentative discourse is not always the most difficult to apprehend. Indeed the difficulty of apprehension is sometimes greatest when the discourse consists of a long series of propositions in which under one set of circumstances one thing is affirmed or denied, or commanded or forbidden; and under another, of circumstances, the things are affirmed or denied, or commanded or forbidden; or when things are stated, affirmatively or negatively, with a great many exceptions and limitations. A perusal of a modern act of parliament will show that this is so.

Sometimes the subject is too complex to be, and in fact may be, a difficulty even in a very simple sentence, as to the resolution of it into subject, predicate, and copula. The discussion of this matter belongs to the doctrine of propositions; but some of each may be said, that so far as all propositions are contemplated in their formal and not their material character, they agree in this, that the subject is viewed as something either co-extensive with or included in the predicate. Both the form of language and the form of thought of which language is merely the exponent, forbids us to contemplate a subject in a greater extent than its predicate. The sentence 'I hope to succeed' is thus reduced (Whately's Logic, p. 59).

I hope to succeed; which is the same thing as 'success is my hope'; and the remark is made 'that an infinitive (which the author has already defined) or a noun (subject to the predicate) is never the predicate, except when another infinitive or verb is the subject. But we may just as well express the proposition thus:

What I hope is to succeed;

that is 'my hope is success.' Now as both 'hope' and 'success' are general terms, that is, are words capable of being applied severally to an infinity of particular things, and as neither hope nor success are conceived by the mind in any relation of substantial connection to anything, so that, either of containing or contained, or of species and genus [GENUS], it is indifferent whether we use the phrase my hope (subject) is success (pred.), or success (subject) is my hope (pred.). But this sentence, we conceive, would by most people be reduced thus:

I hope to succeed;

where 'hope of success' is that which the subject, e.g., predicates of itself, and in these words or a literal operation in which the subject (it matters not whether contemplating itself or contemplated by another) is viewed (logically) simply as within certain limits of predication.

Every simple sentence which is intelligible is reducible to the form A is B, or A is co-extensive with B. Here it must be observed that the former sentence has two meanings, as already observed. It may mean either that A is contained in B, or that A is co-extensive with B, where A is the subject, and B the predicate, and is the thought. It is important to bear in mind this meaning of the sentence 'A is B.' If it should be said that 'A is B' may also mean 'A contains B;' we can then say that B is contained in A; and so we are where we were before. In ordinary language the ambiguity of the sentence 'A is B' is sometimes removed by words of limitation, as 'all,' 'every,' 'some;' but frequently there are no such words used, and the consequence is ambiguity.

The sentence 'A is not B' may mean either that A is not co-extensive with B, or that no part of A is contained in B, or even that the negation of A is contained in B; but this ambiguity also is generally avoided in common speech by the use of words of limitation, or by attaching the negative to the subject. It is obvious that negative propositions are subject to more ambiguity than affirmative propositions. Negative propositions are generally given less trouble, and it is clear that we only obtain a clear notion of their import by a tacit reference to affirmative propositions. In itself a negative proposition has no meaning; by the very suppression of its being negatived it excludes the notion of all significance; and yet by means of every such opposition we attain to knowledge. The Stoics (who seem to have had a logic of their own) called such a sentence as 'Pleasure is not good' an affirmative sentence also; their reasons for this are that obscuringly, by Apuleius. (Philosophy of Plato, lib. iii.)
Simple sentences are generally combined in written or spoken discourse in such a manner that the whole meaning of the speaker cannot be reached except by considering two or more sentences together. Sentences may be so combined, either in the way of co-ordination or sub-ordination, but this distinction, which is made by Dr. Becker in his excellent Grammar of the English Language, is not applicable to some extent to all languages, is perhaps more particularly applicable to the German language than to our own. Two sentences are combined by way of co-ordination when they are connected by such a conjunction as 'and,' 'or,' 'but,' 'yet,' 'then,' 'and' 'since' (not as words indicating time), 'because,' and some others. All languages have words which correspond in meaning to these words. Now it is the combination of sentences produced by such words as 'and,' 'or,' 'but,' 'yet,' and 'since' which takes a large part of discourse, written or spoken. When the discourse is bare narration of facts, it is often more than a succession of affirmative or negative propositions, but so connected and expressed as to render the discourse less tedious than if they were connected separately and in their simple form; but still not logically connected. Besides the ornament and variety which we are enabled to give by written discourse to mere narrative, there is generally a kind of coherence or sequence in the bare facts of narration, which, when some facts are known, can be anticipated by the reader or hearer, and this again helps to render the language of bare narration less tedious.

But when discourse is not limited to bare narration of facts, it assumes a form which still more interests the hearer or reader, and keeps his intellectual powers in constant exercise. Here the discourse does not barely communicate something from the writer to the reader: it does more; it gives itself over to the task of making the reader understand the writer. In the reader and the writer, and it is constantly proceeding on the assumption that a great number of universal propositions are admitted to be true by the reader and writer. Thus, if we say of a certain man—'he is not liked, because he is presumptuous,' two things are affirmed; first, that 'he is not liked,' second, 'that he is presumptuous.' But by the use of the word 'because,' the writer means to affirm something more than the truth of the two propositions; for we may suppose it possible that there may be a connexion of reason between the propositions related to one another in any other way than as relating to one man as the subject. The word 'because' he is presumptuous' is designed by the writer to convey a connection with a relation to something not before taken into account, which connexion or reason extant in the mind of all other persons as well as in his own, or it cannot be understood. Now, what is that connexion which he and all mankind, and a large part of mankind unconsciously, connect with the term compound of the subject. The subject of the whole sentence is some given person or individual who is said 'not to be liked,' a proposition universially intelligible. It is said 'to be presumptuous,' which is also universally intelligible. Now, the word 'be ing' is not a proposition; it introduces to the reader's notice to which the universal judgment of mankind attaches the notion of dislike; something which is followed by dislike; something without which there may be dislike, but with which there must be dislike; that is, must be in this sense: the reader does not know the individual spoken of, and therefore does not know that he is disliked till he is told so; but he knows something of that individual, namely his presumption, and he also knows that he dislikes a presumptuous individual. He therefore understands the writer, and he admits that statement which is introduced by the word 'because' as a reason (to use the common expression) for his dislike. This is an example of a propositional connexion that the writer and reader can collect the writer's meaning. But there is no logical inference here; there is no syllogism.

The speaker or writer might however say, all that he knew of a certain man was that he is presumptuous, and I might add to the sentence, and I therefore conclude that he is disliked. If the reader or hearer assented to the conclusion introduced by the word 'therefore,' he would confess to the following mode of stating what he had heard:

1. All presumptuous persons are disliked.

2. This man is a presumptuous person.

3. Therefore he is disliked.

which is called a syllogism, and is one of the most common forms of a syllogism, in which the first part, or major premise, is thus expressed. The written or spoken discourse is either in this form or in that of a consecutive series of syllogisms, called, by logicians, sorites.

The first two propositions are generally called the premises, and the third is called the conclusion; and in the latter it is frequently supposed to be deduced or, in the case of two other propositions, one of which, as already observed, is commonly suppressed, but is referred to by such a word as 'because,' 'thought,' 'on account of,' and so on, and it is proceeded upon by a syllogism. In the common form of language something is affirmed particularly as a fact, and something is said in the way of a conclusion. The mind perceives no reason why this conclusion is made in the particular way, nor why there should be one instance of the same kind. But while something is in form concluded particularly, something is by implication affirmed universally. A person not accustomed to analyse his own thoughts may not always be able to discover what is that universal affirmation in which the conclusion is contained; but if the argument, as it is generally termed, be expressed in the complete form of a syllogism, he at once perceives what universal proposition must be admitted or proved, in order that the particular one shall be true; he has also given his assent to the admission without a clear conception of the extent of the admission which he will be considered to have made, he is enabled by means of the syllogistic form to examine more clearly that mental operation, the justification of the truth of the conclusions of the syllogism proves nothing as an inference or illation; it necessarily follows from the premises, that, is, the mind cannot conceive it otherwise; and in this operation it is subjected to laws of thought which are irresistible. When the truth of the premises is ascertained or admitted (which, for the purpose of argumentation, is the same thing) the conclusion, which before was logically correct, now becomes also true. All discourse of the kind called argumentative, indeed all discourse so far as it contains inferences, may be considered in the form of a syllogism, in which the premises will appear what universal affirmations or negations are implicitly contained in the discourse. It will also show what universal affirmations or negations are used as a means of attaining to other affirmations or negations, or of preserving from them, and what premises must be ascertained or admitted when attained become the premises of other conclusions. Discourse of the argumentative kind has for its object to establish particular things, or things which are comprehended within other particular premises. Any syllogistic discourse, therefore, the writer who has particular things to prove, alleges, expressly or by implication, universal truths, and he affirms, either expressly or by the implication of language, that the particular things are contained within the universal. If the reader assent to the universal truths, and also admit that
the particular things are contained therein, the writer accomplishes his purpose, and his demonstration is complete. He is said to have deduced something to have made a deduction. If all written or spoken discourse were in the form of perfect syllogisms, there could be little confusion or dispute about what is called the premises and the conclusion, for the whole matter would be so placed before the reader as to be proved or assumed. The conclusion within which it is affirmed that the particular is included. It is then the general condition of every syllogism imperfectly expressed, that when we are speaking of what we call one thing, we are in effect speaking of many things; for the ground which the trees are flourishing upon is asserted of all things of the kind, and it is not possible to conceive it true of one without conceiving it true of all.

Some writers have observed that the causal conjunctions are employed to denote respectively cause and effect, as well as accounted for; that is, the cause and the effect. The former case is known because the trees on it are flourishing; or, the trees are flourishing, and therefore the soil must be rich; where the conjunctions because and therefore are considered to be used to denote the connection of premises and conclusion. But in the following, the trees flourish because the ground is rich; or, the ground is rich, and therefore the trees flourish; the same conjunctions, it is said, are used to denote the connection of cause and effect. In the latter case, whether the ground is the cause or the effect of the trees, being evident to the eye, would hardly need to be proved, but might need to be accounted for; and as to the former case, it is remarked, that the luxuriance of the trees is not the cause of the soil’s fertility, but only the cause of the other things.

Now in the expression, the trees are flourishing, and therefore the soil must be rich (if for must be we write is, which ought to be done), it may be meant to affirm, either that the trees are flourishing, and that the quality of the soil is such that, from the trees, from the ground, the trees are flourishing, and that the soil also is rich. In the former case the richness of the soil is concluded, according to the common expression, from the suppressed premises of the invariable coexistence of flourishing trees and rich soil, and as the word is used as a transpositive expression, it is the same thing that a rich soil is necessary in order that trees may flourish, the richness of the soil is in fact, according to the common notion of cause and effect, here also considered to be the cause of the luxuriance of the trees, or on the soil. In the latter case, if both things are affirmed, both that the trees flourish and that the soil is rich, the same thing is affirmed as in the sentence the ground is rich and therefore the trees flourish; and in both these cases, when the two propositions are affirming, the order of the words is immaterial. Thus in conclusion, nothing more is effected by the word therefore than to suggest the notion of the invariable coexistence of flourishing trees and rich soil.

The conclusion of the ground being rich because the trees on it are flourishing (the richness of the ground in question not being known otherwise than by the trees) cannot be made except from the premises, wherever trees flourish, there the ground is rich. Now though it may be true that wherever trees flourish, there the ground is rich, it may not be true that wherever the ground is rich, there trees flourish, for the ground may be rich, and covered with water in which trees will not flourish. But if we affirm that wherever trees flourish because the ground is rich, we have only been speaking of the ground as it is, which again is nothing more than affirming if by implication that wherever trees flourish, there the ground is rich, leaving it, as before, possible that there may be rich ground where trees do not (for some reason or other) flourish. Now it is evident that, though this is the case, the luxuriance of the trees is considered to be the cause of my knowing the fertility of the soil; that is, in the conclusion, the ground is rich because the trees on it are flourishing; the ground is rich is my (concluded) knowledge and expressed as the effect as between flourishing trees and my knowledge. In the latter case, where both propositions are affirmative, both of them in the way of conclusion, it is said that the luxuriance of the trees does not require proof, but requires to be accounted for; that is, richness of soil and luxuriance are here considered in the relation of cause and effect. According to this, a relation of cause and effect, though not of the same cause and effect, is indicated in both cases by the word because, and in the former case the richness of the soil is considered to be proved also.

This is rather perplexing, but perhaps the perplexity may be got rid of thus. The ground is rich, because the trees on it are flourishing, is necessarily true, if it is also true that wherever trees flourish, there the ground is rich; but this general proposition must be proved in some other way. But the latter conclusion may also be a true conclusion. The trees flourish, because the ground is rich: here both facts are proved or assumed (which for the present purpose is the same thing), and it is also affirmed by implication that wherever trees flourish, there the ground is rich. The difference between the two sentences then is this: the former affirms that a particular soil is rich, if soil is always rich under similar circumstances; and the reduction of the expression to the complete syllogistic form shows us what must be proved or assumed in order that the conclusion to be true in this particular case. The latter affirms the particular thing to be true, which in the former is only true upon a certain condition; and it also affirms by implication the truth of this certain condition. The former is a syllogism, because that which is said of the whole may be said of the part. The latter is nothing more than the implicit statement of a general proposition contained in the explicit statement of a particular instance: it is no logical inference; it is no logical induction; it is simply a statement of a thing being true in a certain case, with the implication that the same thing is true in all similar cases; in other words, the form of language implicitly contains the affirmation of a general proposition, which can only be the result of an induction in the most logical sense.

The difference between logical Deduction and Induction is explained in the article INDUCTION. But it will not be out of place to say a few words on the subject here. In the Deductive Syllogism, we proceed from the whole to its parts, from the ground to the trees; in the Inductive Syllogism, we proceed from the trees to the ground. Thus we see that there are two things contained; and this is true notwithstanding it is not so expressed in the common form of language. For the particular conclusion, as already observed, is the thing which in ordinary language is said to be proved; but there is no such inference in the particular case, and it is shown that the particular conclusion is contained in a general proposition.

The deductive syllogism as already explained shows what this general proposition is, and this general proposition is assumed to be true, or is known to be true in some other way (by induction, properly so called, that is, by instance) than by means of the syllogism. But there is another mode of operation by which the mind can proceed from particulars to generals; but this, which may be called the Inductive Syllogism, is no syllogism, that is, no necessary conclusion, which in general operation may be or assumed to be enumerated; and in this consists the difference between the Inductive Syllogism and Induction, or what is sometimes, but we think, not with strict propriety, called Inductive Reasoning, which is an operation of reason, but one of the understanding only; or, to prevent disputes about terms, it is not the same mental process as that of the Logical Induction, for its conclusion is not necessary. This Induction then, which leads us from the observation of one or more like facts to make a general assertion which will comprehend like facts not observed, is a material illusion of quite a different character from the other. This process has sometimes been absurdly considered as a peculiar discovery of modern times, though it must have been made by the first use of his eyes. The process of investigating and collecting facts which are among the phenomena of the material world, has been greatly improved in modern times.

That syllogistic form which is properly called Inductive Syllogism is extremely rare, though Aristotle (Analyt. Prior. ii. 23; Topica. i. 12) and is not confounded by him with the material induction of a general law or rule from the examination of a number of particular cases of a like kind. *

If we wish to prove syllogistically the mortality of a given individual John, we say—

All men are mortal; John is a man; Therefore John is mortal.

Now this conclusion is necessary, because ‘John’ is con...

* Εσενεγκα μεν οὑν ιττων, και δι άταπαθείος συλλογισμὸς, το δέ τοι ζύγιον άταπαθέων τού χων σύλλογισμον.
tained in 'all men.' But supposing we wish to prove our primary proposition, that 'all men are mortal,' what is the proper form of our syllogism? The three mortals of all men who have died, but we cannot affirm it of all who are living and who shall live, for that is the thing to be proved. This is a case in which there can be no logical, that is, no necessary conclusion.

Dr. Whately says in 2921 that in the process of reasoning by which we deduce from our observation of certain known cases an inference with respect to unknown ones, we are employing a syllogism in barbarsa with the major premise suppressed; that being always substantially the same, the same is true whether we think of the individuals or the class as a whole to which the conclusion is applicable. And if the premises are true, the conclusion is necessarily true. The syllogism then has done nothing, and it leaves the process of inquiry precisely where it was before the induction was put into this so-called syllogistic form.

To take Dr. Whately's own example: 'from an examination of several tyrants' (p. 53, defined to be a syllogism when regularly expressed), may of course be stated syllogistically; but so far forth as it is a process of inquiry to obtain the premises of that argument, it is of course out of the province of logic. But a syllogism which is equally good (p. 14) if we substitute arbitrary symbols for the terms, without any regard to the things signified by them; and (p. 23) 'every conclusion is deduced from two other propositions or premises.' This so-called induction then, stated syllogistically, is that: that which must follow a syllogism, if the premises true, if the premises are true, the conclusion is necessarily true. The syllogism then has done nothing, and it leaves the process of inquiry precisely where it was before the induction was put into this so-called syllogistic form.

The deducting an inference from facts investigated and collected in an argument is equally good (p. 14) if we substitute arbitrary symbols for the terms, without any regard to the things signified by them; and (p. 23) 'every conclusion is deduced from two other propositions or premises.' This so-called induction then, stated syllogistically, is that: that which must follow a syllogism, if the premises true, if the premises are true, the conclusion is necessarily true.

In this so-called syllogism then we have a suppressed major of this form, 'that which is true of some is true of all,' which must mean either 'everything which is true of some is true of all,' or 'this one thing which is true of some is certain of all.' In the former case, the suppressed major expresses a general proposition, which we must establish in order that our inquisition, which is logically correct, may be true materially; but then this is not the proposition which we profess to be desirous to establish, and, more than that, the whole conclusion is true even if the inference is not collected. If it means that this one thing which is true of some is true of all, this is nothing more than to make the conclusion the major premise, and so to conclude the conclusion from itself. It cannot be supposed that Dr. Whately (p. 53, Defined to be a syllogism when regularly expressed) is by many modern logicians called an enthymeme.*

Dr. Whately observes that the enthymeme (the enthymeme of modern logicians) is not strictly syllogistic, i.e., its conclusiveness is not apparent from the mere form of the expression. The enthymeme, in the case of the proposition that it is from that form we form our judgment as to the truth of the suppressed premises. The expressed (or suppressed) premises may be true, and yet the conclusion false. The reason here given why the (so-called) enthymeme is not strictly syllogistic, is this: that to form our judgment of the truth of the suppressed premises we from the meaning of the terms. This is a singular reason. The truth of the suppressed premises has nothing to do with the validity of the conclusion as an inference. If the suppressed premises are expressed, the conclusion would be true, not because the suppressed premises were true, but whether it necessitated the conclusion. If the conclusion is already made and one premise only stated, the truth of the suppressed premises is not a matter in question, but it is, and when we have ascertained what the premises must be in order that the conclusion may be valid as an inference, we may then inquire if the suppressed premises are true. The expressed premises cannot be true and the conclusion false, for the proper form of the expression, and the expression. Besides, the mere form of the expression does indicate the suppressed premises; if it did not, the enthymeme, that is, the incomplete syllogism, the enthymeme of common discourse, would be incapable of being expressed and understood. And if it is possible that A is C, because or for it is B, which is the mere form of the expression, we see that the suppressed premises is B C, that is, B is contained in or is co-extensive with C; and every person who can comprehend the notion of a containing whole and its contained part will understand what is meant if it is expressed in this form: A is contained in C because A is contained in B. As if a man had found that any one thing could be contained in another (second) thing, he might ask if this third thing contained the first thing. He might, if it is possible, conclude mentally that this one thing was contained in the third; and the form of his expression would be, it is contained in the third because it is contained in the second, in which he would tacitly suppose that the second is contained in the third, and therefore it is not necessary to conclude that the first is contained in the third.

We are now in a condition to show what are the limits of pure logic, or of a pure logic. All propositions and all syllogisms are the subject of a pure logic only so far as they are reducible to a common form. It is possible that anything in common so far as they are all capable of being reduced to a common form or forms; that is, a pure logic is formal.

* It has been observed by a learned writer ('Edinburgh Review,' No. 116) that this is the case with the enthymeme of Aristotle. The following passages may be referred to showing the meaning of the enthymeme: Aristotle: 'Analytic, Prior., i. 27;' Cicero: 'Topics, 13. 14.'
only. Neither the syllogism nor its parts regard the matter, and the propositions which enter into the syllogism are only the object of logic so far as they are connected by is and is not. And since all propositions, when viewed solely as the parts of a syllogism, must be capable of being reduced to the same form or forms, it follows that to connect the parts in the same logical element is to connect is by is and is not are only viewed in that way in which the reason does, and must because it does, view all things which are so presented to the mind independently of the matter, namely, with relation to the notion of a contained notion and contained parts.

If this exposition seem tedious, the fault is with those who, while they profess to teach pure logic, confound it both with an applied logic and with other things also.

There seems to be another error in Dr. Whately, which is a confusion of the syllogistic notions with logical notions. In any logical purpose, unless it be illative, and he adds, the reader must not suppose from the use of the word illative, that this conversion is a process of reasoning; it is not in fact only stating the same judgment in another form. Now if we apply this suppressed premises. As then, if B, it is a logical consequence or conclusion, though not a syllogistic one, that B is not contained in A. This case then would be no unlimited logical conversion of the proposition. If A is co-extensive with B, then A is also co-extensive with the suppressed minor term. The laws of thought necessitate the non-conversion in the one case and the conversion in the other; and if these are not logical conclusions, there is no such thing as a pure logic or reasoning.

In his page 7, he says, The syllogistic shows us reason correctly, or that it shows the process which takes place in the mind when a man does reason correctly. It is however difficult to admit the accuracy of this statement. If a man reasons at all, in the strict logical sense, he reasons correctly. Logical syllogistic, in the form of a syllogism, and his syllogistic is obvious, is it not usual to express, in any way, both the propositions from which we deduce a conclusion. We generally express ourselves by way of a conclusion and one premise. Now this being so, he says, How is a syllogistic formally expressed? Always, whereas, though the speaker or writer may not always be able to discover his own suppressed premises. The conclusion and one premises being given, then the suppressed premises is also given, the conclusion and the expressed premises necessarily connected by is; and this suppressed premises. As then, if B, it is a logical consequence or conclusion, though not a syllogistic one, that B is not contained in A. This case then would be no unlimited logical conversion of the proposition. If A is co-extensive with B, then A is also co-extensive with the suppressed minor term. The laws of thought necessitate the non-conversion in the one case and the conversion in the other; and if these are not logical conclusions, there is no such thing as a pure logic or reasoning.

Thus it appears, the syllogistic is only the proper introduction to a metaphysical; and it was much to be wished that all who have written on the latter had first been subjected to the discipline of the former.

The forms are unconnected under that article, consistently with the plan of this work. In the mean time, till we have some system of logic in our language which is founded upon and grows out of some philosophical system, it is better for the student to study only a single branch of logic, and he has thus to philosophic system, and to apply it to his various studies. For such purpose, a small pamphlet such as Professor De Morgan's 'First Notions of Logic,' preparatory to the Study of Geometry,' London, 1839, seems to us the only kind of book in our language which can be so advantageously attempted here. It is also of some importance to show that the notions of this science do not appear to have been very exact among the Greeks and Romans, which may be one cause of the traditional confusion as to the limits of logic, which has so constantly and so modern times. It may be also useful to show what logic is conceived to be by some modern writers.

There is no definition of logic in the extant works of Aristotle; and if we deduce from his Organon, as we now have it, our notion of what the term comprehends, we shall find that it contains a great deal which does not belong to logic as it has been understood by those who have formed the most exact notions of it. If we should attempt to ascertain what the syllogistic comprehends, it will be found impossible to form any exact notion of its limits and objects.

Dialectic is distinguished by Cicero (Topica, 2) from Topic. 'All exact argumentation,' he observes, consists of two parts, one the speech (discursus) and the other judgment (alteram judicandam). He assigns to Aristotle pre-eminence in both, and speaks of the Stoics as having especially applied themselves to the latter, which they named Dialectic. But the dialectic of the Stoics was by no means the same as the dialectic which Cicero says in his treatise 'On the Orator' (i. 38), and also from the statement of the Stoical opinions as to dialectic by Diogenes Laertius, in his Life of Zeno of Citium. The Stoic dialectic seems to have comprehended logic and, as well as Cicero, as the latter, as he comprehended less than the logic of the Peripatetics.

* See also the threefold division of Philosophy by Diogenes Laertius (Progræmissima, into Physics (physiocracia), Ethics (ethica), and Dialectic (dialeuacea). Zeno of Citium was considered as the founder of dialectic.
In Dr. Whately's treatise, as may be collected from a comparison of various passages, logic seems to be convertible with syllogistic. To reason in the strict sense of the word, is to make use of arguments (p. 18); an argument, when regularly expressed, is a syllogism (p. 55); and logic is the science and the art of reasoning (p. 1): from which it follows that to syllogise and to reason are convertible, and that logic is the theory of the syllogism (p. 73).

This seems to be the meaning of the author, and if such be the proper notion of logic, it must be admitted that the boundaries of the science are very limited indeed. But limited as they really are, in this view of the subject, the encouragement of syllogistic argument, as an argument still contains more than those may be inclined to suppose who have not been disciplined in this practice.

It may be worth while to notice what Dr. Whately says on this subject. He argues that the objects argued about 'consists of two parts, that which is proved, and that by means of which it is proved,' and he adds in a note, that this is the strict technical sense of the word argument, but that in popular use argument is often employed to denote the latter of these two, a technical propriety, whatever the popular use is the correct use, as it is in many other cases. When a man is said to use a good argument, he urges or suggests something which is either proved or universally admitted, and the goodness of his argument consists in the appropriateness of the conclusion or the obvious comprehending within itself something which it is the object to establish or prove. He who argues well, possesses the inventive faculty as defined by Cicer. It is his business to establish one or more things, and to command the special attention of the people by presenting his mind in such a manner as only need be presented in order to command assent, and which are comprehensive enough to embrace the particular things which he has to establish. The argument, in the popular sense, is the premises of the syllogism; or it is the middle term; and it is accordingly explained by Cicer (Topica, 2) to be 'ratio, quae rei dubium facit idem,' the reason, which gives credibility to a thing that is doubtful. Of course that which is proposed cannot be the reason; it is the conclusion of Cicer's meaning of the term. Dr. Whately himself says, 'that which is used to prove the question, if stated last (as is often done in common discourse), is called the reason.' But it is equally the reason whether placed first or last, and it is called the reason with a technical propriety, whatever may be the place which it occupies in discourse. The proper name for the syllogism is argumentation, of which the premises are the argument; and this is the sense in which antient logical writers understood argumentation and argument.

The meaning of the term Logic is explained by Kant with his usual clearness. Logic is the science of the laws of thought. Logic may be considered from two points of view, as General or Special. General logic comprehends only the necessary laws of thought, without which there can be no exercise of the Understanding, and it has no reference to any difference in the objects to which it is applied. Special logic comprehends the rules of thinking rightly on any given subject. General logic again is either Pure or Applied logic. In the former we abstract from all empirical conditions under which our understanding is exercised, as for instance, the influence of the senses, imagination, memory, &c. A General and Pure Logic has consequently only the necessary laws of thought, and is a complete representation of the Understanding and of the Reason, but only in respect to the formal part of its use; the matter which is its object may be either empirical or transcendental. A General Logic is called Applied when it has reference to the rules of the Understanding or the Reason in the subjective and empirical conditions, which we learn from psychology. It has consequently empirical principles, though it is so far General that it has reference to the exercise of the understanding without any distinction of objects. In General Logic the two parts that are considered the doctrine of the Reason must be absolutely separated from that which is Applied, though still General Logic.

* Dr. Whately says, 'The third operation of the mind, namely, reasoning (or discourse) expressed in words, is an argument: and an argument, stated in full language, consists of two parts, the third part of which, therefore treats of the syllogism.' The other two parts, which are briefly treated by Dr. Whately, are c. 1. 'Of the operations of the mind and of terms' and c. 2. 'Of propositions;' but they are very incomplete, and, as we think, very deficient in logical precision. There is a Supplement to c. 1.
not unaptly been compared with arithmetic, and arithmetical
has been compared with it. In arithmetical, numbers are
considered independent of any notions, as something which,
independent of their equality or inequality, that is, independ-
ent of their absolute external relation, have no signification,
as they are independent of these things. In the same way in
the relations express a thought. When it is mechanically
ascertained that \$ \times \$ makes \$, this operation contains
just as much and just as little as thought as the ascertainty
whether in a given figure this or that conclusion
must be made.
Hegel remarks, that with respect to the formation of an
individual mind, logic may be compared with grammar.
Both logic and grammar are something different for him.
He first approaches them and science in general and he
who comes back from the sciences to him. He who begins
to learn grammatical forms and rules, sees in them
nothing but themselves; he who has mastered a language,
and compares it with other languages, is in a capacity to
ascertain the full force of these rules and forms. Through
the grammar he can reach the essence of the mind, the
logic. The case is the same with a man's first introduction
to logic: its signification is limited to itself. Logic must
be first learned as something which a man comprehends
in an abstract extent, devoid of further meaning or meaning
are not discovered. It is not till we have a deeper
acquaintance with the other sciences that the logical becomes
for the mind, subjectively, not a mere abstract universal, but
universal which comprehends within it the abundance of
the 'universal moral', of life and of activity of a youth, even if he understands it correctly, has not the
signification and the comprehensive meaning which it has
in the mind of a man of long experience, to whom the words
convey the full force of the expression. Thus the logical
cannot be a science, for it is the science of the whole
through the sciences: it then presents itself as the
universal truth, not as a particular knowledge co-existent
with other matter and realities, but as the essence of all
of the knowledge.

Logic was defined (by Hegel) as the science of the
pure thought, which has for its principium (principle) the
pure knowledge (wissen); not an abstract, but a concrete
living unity; and concrete in this way, that in it there are
indeed opposed to one another the consciousness of a
subjective self-existence and a subjective such existence, an
object; and that existence is known as a pure Notion in
itself, and the pure Notion is known as the real existence.
These are the two moments which are contained in
real. But only the one is known, not the other; not
probably, and not each in the consciousness as existing by itself;
but it is only by virtue of their being also known as
different (yet not self-existing) that their unity is not abstract,
empty, and inactive, but concrete.

It has the purely logical principium (principle) as its
element, so that the development of this difference, which
is always in it, takes place within this element. Thus the
entire notion is to be considered in the one case as existing
Notion, in the other as Notion simply: in the former case
it is notion of reality or existence; in the latter it is
notion as such, self-existing notion.

Logic will therefore be divided into the logic of the notion
as existence, and of the notion as notion; or, to make use
of the common though very indefinite and ambiguous
expression, contained in Arrighi and others. This division
is essentially such a division, as a sphere of Mediation (vermittlung), or of the
logic as a system of reflective determinations, that is, of the
existence passing into the internal existence of the notion,
which is this way regarded as such by itself, but is
properly affected by the immediate existence of the

This is the doctrine of the essence (wesen), which stands between the doctrine of existence and
the notion; but in the general division of Hegel's
work it is placed under the objective logic, inasmuch as,
though the essence is certainly the Internal, the yet the
character of the subject is expressly appropriated to the
Notion.

Hegel's division therefore is into the objective and sub-
jective, or, more distinctly, into:

1. The Logic of Notion (Die Logik des Wegens)
2. The Logic of Essence (Die Logik des Wesens).

With reference to primary

1. The Parts of the Syllog-

2. The Sylo-

gism.

With reference to secondary

Generally.

Dialectic.

The Topical,

The Prior Analytical,

The Prior Analytical,

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syllogism. Next, what is meant by one thing being or not being in the whole of another, and what we mean by a thing being predicated of all or none. A proposition then is a sentence (λέγων) which affirms or denies something of another thing; and this either universally, or particularly, or indefinitely. By universally, I mean where it applies to all or none; by particularly, where it applies to part or all, or both; and by indefinitely, where it applies, or does not apply, without anything being determined as to the whole or part. The demonstrative (αξιολογητείς) proposition differs from the dialectic (διαλεκτα). The demonstrative is an assumption of one side of the question, and a contradiction; it does not interroga- tion, but he assumes; but the dialectic is an interroga- tion as to the contradiction. This however makes no difference with respect to the syllogism in either case, for both he who demonstrates and he who heges- tates a syllogism by assuming something to be predicated or not to be predicated of another thing. Consequently a syllogistic proposition will be simply an affirmation or denial of one thing with respect to another, in the way already mentioned; and a proposition is true, and obtained by means of the original hypothesis. A dialectic proposition is, with respect to the question, an interroga- tion about denial; but to him who syllogizes it is the as- sumption of that which is apparent and probable, as it is shown in the Analytics Prior. What then is the syllogistic proposition, and what respect a syllogistic, demonstrative, and dialectic propo- sition differ, will be accurately stated in what follows (in the 'Analytics Posterior'); but for the present purpose what has been already said is sufficient.

'the proposition in which a proposition is resolved, as the predicate (τὸ συγγενοθέμενον), and that of which predi- cation is made, with the addition or not of 'being,' or 'not being.' A syllogism is discourse, in which certain things being laid down, something different from these things neces- sarily results by virtue of one of these premises (τὰ ρατὰ). And I mean by the words 'by virtue of the premises,' that this something results by reason of them (κατὰ τὸ ρατα): and 'by reason of them' means that no other term is needed in order to this necessary result. Now, I call that a perfect syllogism which considers the whole, and that which is as- sumed or granted in order that the necessary conclusion may appear. I call that an imperfect syllogism which re- quires one or more things which are of necessity by virtue of the given terms, but are not assumed or granted in the propositions. For one thing to be the whole of another, and one thing to be predicated of the whole of another, is the same thing; and I mean by predication of the whole of a thing, when one cannot conceive any part of the one thing (the subject) without the other (the predicate); and the like when the predication is of no part of a thing. It was apparently the object of Aristotle in his so-called logi- cal treatises, as we now have them, to make a perfect system of argumentative discourse, and not merely a logical (properly so called) system, which is probable and that class was extant and arranged according to his own method, we should see still more clearly that the whole was not con- sidered a logical system (as the term logic is strictly un- derstood), but that a logical system (as the term is strictly un- derstood) was contained in it. Whether Aristotle or any other person put the existing books of the Organon to- gether, neither the author who conceived them in con- nection with one another, nor any one else, considered them as forming a pure logical or even a pure dialectic treatise; but as an arrangement of argumentative discourse, as enough from an examination of the contents of the Organon, and the remarks of Cicero ('Topici') and his commentator Boethius, who was himself a writer on logic. Boethius, whose text of Cicero, informs us that his Peripatetic predecessors understood their term as Cicero understood it, and Cicero defines it to be 'disserendi diligentis ratio,' or 'an exact method of argumentation.' The Peri- patectes, he adds, understood logic to consist in invention and judgment. The Stoics, who have stated invention, considered it to consist in judgment only, which they dis- tinguished by the name of dialectic. Thus the logic of the Peripatectes was larger than the logic of the Stoics. The logic of the Peripatectes consisted, first of topic or invention, which teaches the method of easily stating arguments; and Boethius remarks that Aristotle in his 'Topica' treats of the 'maximus propositiones' (called fact), which are un- demonstrative or probable propositions, and from which we descend to the conclusions of the syllogism. Judg- ment is more particularly exercised in making conclu- sions (in colligendi ratione), but inasmuch as all argu- ments are erected on demonstration, or probable propositions, we have to consider both the matter of proposi- tions and their connection. As to the matter, we have to consider whether the propositions are true, or necessary, or probable, or sophistical. As to the connection, we have to consider whether the propositions are demonstrative, which may be called the form of the arguments. Logic then consists of invention, and of the conclusions from invention, or the form of the argumentation. The part which treats of invention supplies the instruments or means for invention, and, as already observed, is quite distinct. The part which relates to judgment supplies certain rules for discerning or separating (discernendi), and is called Analy- tics: so far as it treats of the connection or union of proposi- tions, it is called Analytica Prior: so far as it treats of the invention of the premises, it is called Analytica Posterior: when it is engaged about discerning necessary arguments; but when it is engaged about false and deceptive arguments (casuistico), that is, sophistical, it is called the Elenchi. And as what is most useful in Discourse, and how it is more complete manner than the Stoics, since be treated of the two things besides which there is no third, namely invention and judgment, while the Stoics neglected invention and only furnished us with the instruments of judg- ment.

This statement of what the logic of Aristotle was, may help to remove certain long-rooted mistakes on the matter. Dr. Whately, who confines logic to the pure syllogism in his theoretical view of the subject, though not in his prac- tical and exclusive definitions of it, says that 'with the exception of Aristotle, hardly a writer on logic can be mentioned who has clearly perceived, and steadily kept in view throughout, its real nature and object.' And he remarks that even Ari- stotle is not entirely exempt from the error of mistaking the discourse of the whole or part of a thing for the discourse of the whole of a thing, and that he has no proper connection. Now the fact is that Aristotle's logic, being what we have here explained it to be, is a very different thing from what it appears to be considered to be by many. To say that Aristotle is not entirely exempt from this mistake of not mentioning the ideas of ex- pansion, when three-fourths of his Organon have nothing at all to do with the pure syllogism. In fact Aristotle's Organon, and his logic as explained by Boethius, are much more like Plato's much abused 'Right Use of Reason' than like what many others are wont to call the writers to.

There is a short but not a satisfactory account of the contents of Aristotle's Organon by Dr. Thomas Reid, Edin- burgh, 1806. It may however serve to give the reader some notion of the contents of that work. The best account of it is said to be by Barthlemy St. Hilrite, 'La Logique d'Aristote, 2 vols. 8vo.'

The controversial tone of this article, in a work of this description, may require a word or two of apology. Until the limits of Logic are better defined, the subject must be controversial, for the question What is Logic? must con- tinually recur. The work with reference to which these remarks are chiefly made has long had a great circulation, and has taken the place of former treatises, which is a mark of its being written for the people; and the author think it should be pointed out. In various parts of his work, Dr. Whately has explained with sufficient precision what he considers Logic be: he has in fact defined it as the pure syllogism, irrespective of all material considerations. It cannot be supposed that a writer, however able, can so far deviate from a scientific method of thought as to be prejudicial to his work.'

Two reviews of Dr. Whately's treatise have fallen under our notice, one of which appeared in the 'Westminster
which are generally considered to be genuine, viz. 1. σω-
γιαί λατρεια, 'Collecta Medicinalia'; 2. σω-
dες, 'Synopsi-
as ad Buthastium'; 3. ἵππος, 'Euporisata ad Eu-
piam', or 'De facie Parabilius.' The first of these works,
when composed, we learn from the preface or dedication
preserved by Photius, at the command of Julian while
they were in Gaul together, and consisted originally of
seventy books, according to Photius (Biblioth., cod. cxxvi.),
or, as Suidas says, of seventy-two; whence it is also
called 'De ecclesiasticis.' A second work which consisted
almost entirely of extracts from Galen and other
authors, we possess rather more than one-third part,
respectively books 1-15, 24, 25, 43, 44, 45, 46, 47, 48,
49, and 50. They are extremely valuable, both as contain-
ing a considerable number of works which are now lost,
and also as serving frequently to correct and explain differ-
ent sentences in Galen’s works. It would be impossible
here to give anything like a complete analysis of so large a
work, and perhaps this is the less necessary as it contains
little original matter; but it may be useful to give a
general idea of its contents, mentioning at the same time
something that may appear especially worthy of notice.

The first five books treat of Dietetics; lib. vi. contains
directions about sleep, exercise, friction, &c.; lib. vii. is on venen-
ous poisons, &c.; lib. viii. is a treatise on plants, &c.; lib.
ix. on colds, &c.; lib. x. on fevers, &c.; and lib. xi. is on
the use of animal and artificial baths, containing a
particular account of the oil baths and oil and water
baths; the five following books are on Materia Medica:
the sixth book is on a complete system of anatomy and physiology, taken
entirely from Galen’s great work, ‘De Usu Partium Cor-
poris Humani.’ It should here however be noticed that
Oribasius is the first author who gives an account of
the secretions of the glands, &c.; and the seventh book,
looked by Galen; at least no description of them is to
be found in any of his extant anatomical works. The pas-
sage in Oribasius occurs lib. xxiv., cap. 8, and is as fol-
lows: ‘On each side of the tongue you will find the orifices of the vessels of the tongue, and between them they form, upon the
most intimate terms, as is proved by one of Ju-
lian’s letters addressed to Oribasius, which still remains
(Epist. 17), and is at the same time a monument of their
supersition and pagan idolatry. When Julian succeeded to
the throne, he had been, for some months past, at rest,
Oribasius to the rank of qeustor of Constantinople (Suidas),
and afterwards sent him to consult the Oracle of Delphi,
where he brought back the celebrated answer, that the
Graecians had ceased to worship Apollo. (Cecchini,
Chermas, ed. Paris, 1647.) Oribasius accompanied
the emperor in his expedition against Persia, and was pre-
sent at his death. (Philostrat., loc. cit.) He afterwards
fell into disgrace through the envy of his enemies, had all his
estates confiscated, and was banished by Valentinian and
Valens. He supported his misfortunes with fortitude, and
by his medical talents gained so much love and reverence,
that the barbarians (as they are called) began almost to
adore him as a god. At last the emperors, feeling their loss of their professional skill, restored him from banishment,
restored his confiscated fortune, and loaded him with
honours. He was still alive when Eunapius, who was his
immediate friend, wrote his account of his life, which is placed
by Lardner (History of Testimonies, &c.) about the year 400
(Quellen der Geschichte Eusebii, ed. 1838, fol. 43), and
was as much as fifty years after his attending
Julian in Gaul, he must have lived to a good old age.

There are in the Greek Anthology two epigrams written in
honour of him (lib. 1, p. 85, and lib. iv., p. 496).

He was the last of the emperors’ physicians to be written
of by Photius, of several works which are no longer extant. A Commentary
as the Aphorisms of Hippocrates goes under the name of
Oribasius, but it is manifestly spurious. The author, who
appears to have been an indigent and enthusiastic
Quotations from Holy Scriptures, and says in the preface that he wrote them
in order of Potteryom Euyergestes. It is of little value, and was
first published at Paris, 1533, svo. ed. Jo. Guentherus An-
vercensis, Lat. The Greek text, if it exists at all, has
never been published.

We have now two works bearing the name of Oribasius,

Or 11

Review for January, 1828; the other in the ‘Edinburgh Review’ for April, 1833. The former shows that Dr.
Wattley is not alone in some of those opinions which we
encounter erroneous. The latter is from a master-hand, who
is well acquainted with both ancient and modern writers on
law and philosophy. To this article we are much and
debtedly.

Several treatises on logic have appeared in Germany,
which profess to exhibit the subject according to a strictly
keyboard. Among these may be mentioned Kier-
53

...
edone, 'Synopsis,' and addressed to his son Eustathius) consists of nine books, which, as we learn from the preface, was composed after the former work, and is an abridgement of it. In the first book he treats of various kinds of exercise, baths, external applications, cupping, scarifications, leaching, &c.; he also describes diseases affixed to it which are the source to open in phlebotomy, and says that it is dangerous to touch the median, on account of the proximity of the nerves; that arteriotomy should be performed on the temples or behind the ears. He next cites the effects of other simples, both of their properties and of their uses (lib. iv.); he also contains a treatise on various medicinal substances; lib. v. of materia medica; lib. vi. of fevers, contagion, &c.; lib. vii. of surgery; lib. viii. of diseases of the head, eyes, and ears; lib. ix. diseases of the thorax, abdomen, kidneys, &c.; also on diabetes, in which disorder he recommends sordorifics. The Greek text of this work has never been published; a Latin translation by J. Bapt. Rasærius appeared, Veneti, 1554, 4to, ap. P. M. Mauritius.

The third extant work by Oríchus bears the title of lusoria, 'De facilis Parabulis,' and is addressed to his friend Euænus (though some copies in the time of Photus read Euenus), at whose desire it was composed, and who requested that he would sign the title with the name of his messenger. It consists of four books, which seem to be a short abridgment of his great work, chiefly taken from Galen, Dioscorides, and Rufus-Æimum. It genuineness is doubted by Sprengel. Of this work this Greek text has never been published; but a Latin translation by J. Bapt. Rasærius, Veneti, 1558, 8vo. Rasærius also published, Bâlg, 1557, 3 tom. 8vo., an edition of his translations of all the works of Oríchus, which are inserted in the first part of the edition of Aristotle, Paris, 1559, 4to., by Sprengel.

Oríchus has been called 'Galen's ape,' and it is true that he seldom contradicts him; but he has also inserted in his works so much that is original, that it is surprising that he should have confined himself to the office of a mere copyist.

ORICHALCUM, or AURICHALCUM, one of the ancient names for brass. [Brass.]

ORICOU. [Vulturidae.]

ORIEL. The origin of this term is very obscure, and has hitherto baffled all etymologists. Some have supposed it to be derived from Oriæs, as if windows of this description were first introduced in an eastern aspect; of which there is no proof, nor indeed any probability. Others have supposed it to be borrowed from the Latin word oratores, signifying a small oratory or prayer-closet, to which use such bays within chambers may have been occasionally applied. The term Oriel, however, is thoroughly English, of which borrowing now is sufficient to make it so clear and precise. It is applied to that particular kind of bay-window which is made to project from the upper story of a building. The distinction therefore between a bay and an oriel is this: by the former is understood a project of the window, or rather a projection pierced as to depth openings in its entire width, and rising immediately from the ground, whether it be confined to the lower part of the building or carried up through one or more stories above the ground-floor; by the latter, a bay which does not descend to the ground, but is suspended over the face of the wall beneath it. Oriel accordingly corresponds with the German terms Erkerfenster and Chorfenster, which are almost the only ones of similar import in any foreign language. This absence of a corresponding term in English is accounted for by the thing itself being scarcely known in the architecture of other countries, and in our own it occurs only in our Domestic Gothic or Tudor, such form of window being very rare indeed in ecclesiastical structures. In our domestic, which also comprises collegiate architecture, it is a beautiful and valuable feature, and one which admits of very great diversity of design, and also imparts much variety and liveliness of effect to a building, more especially if there be ground-bays likewise, the two kinds of projection both harmonising and contrasting with each other. Internally there is no distinction between Bays and Oriel, inasmuch as both the one and the other form a recess whose sides are filled with windows. But greater variety of plan occurs in oriel than in bays, which are usually more spacious as to the breadth and of shallower proportions as to depth; they are either rectangular in plan, or form three sides of an octagon, whether a regular one or not; whereas curved forms are of frequent occurrence in the plans of oriel, and are occasionally combined with straight ones. Yet as similar plans do occur in bays, no real distinction can be founded upon such open work of design of glass only. Gloucestershire, contains an example of a bay of very unusual character, both in respect to plan and elevation, its plan in the upper part being different from that of the lower, and in some degree projecting over it, as is indicated in the section considered singly, the plans have a picturesque complexity, and that such quality is greatly enhanced by their being combined.

Oriel windows generally terminate in either a plain or embattled parapet; but oriel are for the most part made to show some sort of roof, either rising behind or resting upon the mouldings which serve as their cornice. Occasionally the roof or crown is rendered an ornamental part of the design, and is built up in structural masses, necessary here to be described as consisting of three distinct parts, viz. the supporting portion, consisting of a series of mouldings, spayed off so as to come down to a point below, somewhat after the manner of a corbel (for which member we would accordingly suggest corbel-stool or corbel-base as a significant and very convenient term); 2ndly, the body of the oriel, consisting of the window-apron or window-parapet, and the window-openings themselves, the former of which is almost invariably paneled so as to correspond with the lights themselves, whereby the whole is made to consist of a series of panels, those in the lower range being blank or solid, the others perforated and glazed; 3rdly, the crown or roofing, occasionally including under that term the ornamental finial, if such. Others have pointed out that happens to form a conspicuous termination to the design, as is the case with the semicircular oriel at Great Chalfield, where the parapet is formed by a rich bandeau or crown of strawberry-leaf ornamental or Tudor-flowers in open work between them. The Chalbury Castle, a beautiful example and all its details, see Walker's Manor-House at Great Chalfield.

The corbel-stool admits of very great variety and freedom of treatment. It is being sometimes formed of few and bold bays; other times, out of more or less of each kind. Neither does it invariably approach to a point at its termination, but finishes horizontally, and in some instances in a line as wide as the central division of the window. In fact there is such great diversity of design in respect both to the general plan and design of the corbel-stool, that it is impossible here to enumerate all the varieties. In some oriel this part is made to assume the form either of a single or double pendant; in others the mouldings are continued for some distance instead of being carried horizontally. These pendant-like supports sometimes rest upon or seem to spring from armorial shields, carved heads, or other ornamental devices: neither are instances wanting of the corbelle resting upon a column or some other kind of shaft, for which purpose the suitable denomination would be corbel-stool or corbel-stem. In some later examples, again, of the Elizabethan period, instead of being supported beneath by corbellesi, the window rests upon large trusses or brackets; windows of this description, however, take very little of the character of oriel, and can hardly be described as being of the same class. Some distinctive term therefore for windows of that sort would be useful, as would likewise some other others, in order to express various particulars which, for want of them, cannot be pointed out without more or less of aimless locution. The term jutting-window might be adopted for
that species of upper window, which, although situated like the oriel, merely juts out from the surface of the wall, and forms scarcely any recess within the room. On the other hand, where a window, either vaulted or fellows in an unduly deep recess or distinct alcove to an apartment, having its ceiling defined from that room instead of being in continuance of it, such window might, as regards the interior, be very well described as a box-window, which term was applied to an alcove in the Library at Oxford; the viciage of St. Mary the Virgin, in Oxford; the oratory of Swaynewikke and the viciage of Twerton, in Somersetshire; the rectorcy of Chalderton, in Wiltshire; and the vicarage of Aberford, in Yorkshire.

The number of members upon the college books, Dec. 31, 1838, was 327.


ORIFLAMME. [Banner.]

ORIGENES (Origen), commonly called by English writers Origine, was born in Egypt in the year 184 or 185 B.C. He was professor of philosophy at Alexandria, and brought up in the Greek religion, but this is denied by Eusebius. He received instruction from Clemens of Alexandria, then a catechist at Alexandria, and at a later period from the celebrated philosopher Ammonius Saccas. In the year 222 his name was enrolled among the martyrs. Though not quite seventeen years old, Origine was hardly restrained by the care of his mother from offering himself also to martyrdom. He sent a letter to his father in prison, containing the text of a letter, that you do not change your mind for our sake.

After his father's death, Origine was supported for a short time by a rich lady of Alexandria, but he soon became able to maintain himself by teaching grammar. At the age of eighteen, he was ordained a presbyter of the catechical school in that city, to the duties of which office he devoted himself entirely and with great success. During this period he supported himself by the sale of his library of ancient authors for a daily stipend of four oboloi, on which he received from the purchaser. We are not told how long this payment was continued. In his twenty-first year, having taken up the opinion that the words of our Saviour (Matthew, xix. 12) ought to be understood literally, he castrated himself; in later life he confessed his error in this matter. Soon after that letter he wrote, a thing very unusual at that time (Hieron., De Vir. Illust., c. 56); but his knowledge of the language was never very great.

About the year 212 his preaching reclamed a great part of the Valentinians, and he was sent to Rome by the bishop of Rome. In theแซร.image of Ambrose, who afterwards assisted him materially in the publication of his Commentaries on the Scriptures. He was sent by Demetrius into Greece upon some ecclesiastical business, and on his way thither, in 328, he was ordained a presbyter at Cesarea. In 329 he was ordained a bishop of Cesarea, and sent to Rome by the emperor Alexander on some business relating to the Jewish community.

Among the eminent persons educated at this college were:—Archbishop Arundel; Raymond Peckock, bishop of Chebester in the time of Henry VI.; Bishop Butler, author of the 'Analogist'; Barclay, the translator of Brandt's 'Ship of Fools'; Cardinal Allen; Sir Walter Raleigh; Pryme; Chief-Justice Holt; and Dr. Joseph Warton.

No part of the present buildings of this college is of an earlier period than 1719, when the south and western sides of the ancient quadrangle were rebuilt. The hall and chapel, which are on the eastern side of the quadrangle, were rebuilt between 1637 and 1642. About or soon after this time, the north side was rebuilt and the east side unpaved with the gravel used in the main building. The hall is ascended by steps, under a semi-hexagonal porch, above which, in niches in the main building, are statues of Edward II., Edward III., and the Virgin and Child. Besides this quadrangle, there are two yards and west sides of the garden are two handsome buildings: that on the east was built in 1719, at the expense of Dr. Robinson, bishop of London, before mentioned; that on the west, called Carter's building, was constructed in 1729, in pursuance of the will of George Carter. This property to this college, partly for this purpose, and partly to purchase adwons. In 1817 fifteen additional sets of rooms were built on the south side of Bishop Robinson's wing.

Between Carter's and Robinson's Buildings stands the library, begun in 1746, from a design by Mr. James Wyatt, one of the most eminent architects of its kind in Oxford.

The patronage of Oriell College consists in the rectories of Upton Nervet in Berks, Plymprose in Devon, Purleigh in Essex, and of Cromhall and Torthworth in Gloucester.

The college was founded in 1562 by the late George Carter, of St. Peter's Saltdean, in Lincolnshire; the curacy of Morton, in Northamptonshire; the vicarage of St. Mary the Virgin, in Oxford; the curacy of Swaynewikke and the vicarage of Twerton, in Somersetshire; the rectorcy of Chalderton, in Wiltshire; and the vicarage of Aberford, in Yorkshire.
The most important works of Origen were his editions of the Hebrew text and Greek versions of the Old Testament, which were the results of a diligent collation of manuscripts. The Tetraplag, contained the four Greek versions of Aquila, Symmachus, the Septuagint, and Theodotion, arranged in four columns. The addition of the Hebrew text in one column, and of the same in Greek characters in another, formed the 'Hexapla.' Of this great work, which occupied Origen on the whole 15 years, the best edition of which is that by Migne, in 2 vols. fol., Paris, 1821. Of his other works, which were so numerous that one author states that he wrote six thousand volumes, the greater number have perished. His 'Stromata' and 'Principia' (ἐπομ. ἀρχαιολογίας) (Church History, Part I., chap. 28) were compiled in a very curious method of interpretation. The 'Stromata' was in ten parts, and illustrated the doctrines of Christianity by comparing them with the opinions of the philosophers. Three fragments of this work are preserved by Jerome. The 'Principia' was in four books, but we only possess a short notice of it in the 'Myriobiblon' of Photius (cod. viii.), an extract in Eusebius ('Contra Marcium Anencyrum', lib. I., one or two in Justinian's 'Letter to Melo,' and some fragments in the 'Philocalia.' In the fourth century, Jerome made a Latin version of the 'Principia' which is extant; but Rufinus has, by his own confession, added so much to Origen's work, that it cannot be taken as a fair exhibition of his opinions. Indeed all the extant works of Origen are so suspicious.

We have still in Greek his treatise 'De Præst.,' his 'Exhortation to Martyrdom,' his 'Apology for the Christian Religion,' an Epistle to Africans, another to Gregory Thaumaturgus, and fragments of a few other epistles; part of his 'Church History,' his 'Life of Cyprian,' and his 'Catechism.' Of his 'Catechism' there is a Latin version given by Lactantius ('De Inst. Chris.' xi.), but this is only a fragment; 'Philocalia,' containing extracts from his works made by Gregory of Nazianzus and Basil the Great; and in the 'Catena' there are many notes ascribed to Origen, which Huet however considers to be spurious. Several of his works remain only in extracts made by Jerome and Rufinus, but chiefly by the latter. Complete lists of his extant works are given by Huet, Cave, Basnage, Du Pin, and Tillemont, and by Fabricius in the 'Bibl. Græca,' v., 16. The standard edition of his whole works is that of the 'Collectanea Sacra,' p. 20, 1760.

Origeniana; Lardner's 'Credibility,' part ii., chap. 38, and the authorities quoted by him; Mosheim's 'Eclectic-Historical History.'

ORIGENES, also a pupil of Ammonius Saccas, must be distinguished from the other Origen. Longinus and Porphyry mention three of his works, entitled 'On Demons,' the 'Demius,' and 'Galenus.'

ORIHUELA, a city of Spain, and the chief town of the district of the same name.

ORLEANS, a city of France, situated on the Loire, near the bend of that river, in the department of the Loiret.

Orosius, a Latin historian, born in Rome, a. d. 390, died 429. He is celebrated for his 'Histoire des Gaules,' a history of the events of that country from 174 B.C. to 27 B.C., and also for the 'Proslogion,' a defense of the tenet of the faith of the Creator, a work written in reply to the 'Hippogloas' of St. Augustine. The 'Proslogion' is an argument, not so much in favor of the existence of the God of the Christians, as to prove the absurdity of the notion that there can be an 'Eve' without a 'Adam.' The 'Histoire des Gaules' is a work of four books, and is written in the style of the 'Mirobolon' of Phoebus, and contains many curious and interesting facts, and is still considered one of the most valuable works of the Roman history, in which history he follows the ancient authors and theTacitus. He was a man of erudition and knowledge on all subjects; and he was a master of the art of history.

In the fourth century the writings of Origen led to violent controversies in the church. Ephraemi, in a letter preserved by Jerome, enumerates eight erroneous opinions as condemned by the councils, and two others which were drawn from his writings by heretics. In 401, Theophilus, bishop of Alexandria, held a synod, in which Origen and his followers were condemned, and the reading of his works was prohibited; and the monks, most of whom were Orientalists, were driven out of Alexandria. His opinions were again condemned by the second general council of Constantinople, in a. d. 553.
sernery. The huerta yields also abundance of hemp, flax, wheat, barley, canary-seed, lucerne, maize, and vegetables; with winds, oil, silk, soap, hemp, and tobacco, and affords pasturage to cattle of all sorts. It is generally called "the Garden of Spain," a distinction due to its delightful and salubrious climate, the industry of its inhabitants, and the abundance of water which is conveyed to every part of it by means of artificial canals, making it independent of the sky for its supply of moisture, and giving rise to the proverb—

"Libera or no libera, Trigo en Orihuela."

(Rule or no rule, there's grain.)

The population of the huerta, which contains twenty-nine towns and villages, amounts, according to Antillon, to nearly 60,000, of whom about 25,500 belong to the city of Orihuela. The city is four leagues distant from Murcia, four from the Mediterranean, ten from Cartagena, and thirty from Valencia. It is the see of a bishop, and its chapter comprises five dignitaries, seventeen canons, twelve prebendaries, and twelve semi-prebendaries: it has also a collegiate chapter at Alicante. Besides the walls, and five dependent churches; nine conveys of monks and three of nuns (suppressed in 1833), two hospitals, a founding hospital, a house of refuge, a theatre, a public granary, a cavalry barrack, a post-office, and seven inns. The municipal and collegiate universities are connected with that of Valencia, a seminary, and two colleges, in all which education is much neglected.

The city is divided by the Segura into two parts, which communicate by two bridges. It is also divided into four wards, or barrios, which are separated by the city walls and the base of the mountain La Muela, which overhangs it. The streets are straight and broad, but unpaved. The public buildings are not worthy of notice, but the private houses are for the most part regular and tolerably handsome; and the general aspect of the city is cheerful and agreeable.

The inhabitants of Orihuela are noted for their superstition and demoralization; and also for their industry. Though they are for the most part agriculturists, the city has a thriving commerce, and manufacturers of linen, wool, and worsted. A large amount of Murcia is still employed, and was established by Aben Hud. It fell into the hands of the Christians in 1265, when it was taken by James I of Aragon.

Orihuela is one of the most ancient cities of Spain, having existed before Orihuela was the Cartaginians. It passed from their hands into those of the Romans, Goths, and Moors successively; and in A.D. 1057 it was made the capital of one of the petty kingdoms into which the khaliates of Cordoba was divided. It was soon re-annexed to the kingdom of Cordoba, and in 1229 it was ceded to the crown of Murcia, then established by Aben Hud. It fell into the hands of the Christians in 1265, when it was taken by James I of Aragon.

(Misano; Antillon; Laborda, Itin. Descrip. de l'Espagne; Trenck, Itinerario de Spagna; Ingli, Spunt in 1830; Mariana, Hist. Gen. de España.)

ORILON. [Bastion.]

ORINOCO, a large river of South America, which has its origin, according to the most recent information, not in the centre, but on the southern declivity of the eastern part of the mountain system called Parime, but its source has never been visited by Europeans, nor has any information respecting it been obtained from the natives. It is supposed that this river rises near 66° W. long., and 4° N. lat., and ascends 1,000 feet at the mouth of the Orinoco, and is in possession of the Guianas, a race of aborigines of rather white complexion, who prevent foreigners from advancing farther into the mountain region. Schomburgk confirms this account.

At this point the river runs in a general western direction, and several miles farther down it divides into two arms, of which the one flowing to the south-west is called Casiguri, and after a rapid course of nearly one hundred miles joins the Guiana, or Rio de la Plata, thus forming a natural water course between the Orinoco and Amazon, into which later river the Guiana falls. [Brazil, p. 360.] The Orinoco continues a wide river, running in a western direction along the southern base of the Parime mountains, until it approaches 66° W. long., when it is joined by the Atalaia from the south and by the Guiana from the west. From the confluence of the last-mentioned river its course lies to the north, along the western base of the Parime range, and in this part its navigability is interrupted by the Rau- delles and a particular kind of cataract. The greatest volume of water does not descend at once from a considerable height, as in the Nygara river, nor does it traverse a narrow opening between rocks, like the Amazon in the Pongo de Manseriche, but it is forced over the Orinoco from Autes, which is nearly 6500 feet wide, and divided into numerous narrow channels by rocky and rocky islands, through which the water runs with great rapidity, and forms a succession of small cascades. The highest of these cascades are about one hundred miles from the mouth of the Orinoco, six miles only about thirty feet by all the cascades of the Raul delles of Maypures. But the velocity with which the confined body of water runs in the narrow channels renders it impossible to ascend the raudales. The Raul delles of Autes is, though in one place as little as 6000 yards wide, this raudales the river continues to flow between low but rocky banks. Opposite the mouth of the river Meta, which joins it from the west, is a powerful whirlpool round an isolated rock, called the Stone of Patience, from the circumstance of its generally taking two days to pass it at low water.

Some distance farther down the whole bed of the river is narrowed by rocks, which advance into it from both sides, and the current flows rapidly through the Narrow of Barra, which is about 200 yards wide, and is flanked on the left by the rocky base of the mountain La Muela, which overhangs it. The streets are straight and broad, but unpaved. The public buildings are not worthy of notice, but the private houses are for the most part regular and tolerably handsome; and the general aspect of the city is cheerful and agreeable.

The inhabitants of Orihuela are noted for their superstition and demoralization; and also for their industry. Though they are for the most part agriculturists, the city has a thriving commerce, and manufacturers of linen, wool, and worsted. A large amount of Murcia is still employed, and was established by Aben Hud. It fell into the hands of the Christians in 1265, when it was taken by James I of Aragon.
which lie nearly in the middle of the stream. These channels are known by the Indian names of Zacupana and Umasates, and their eastern extremity is not quite thirty miles from Cape Barima, which is situated at the mouth of the river. Both are navigable, but that on the south, called the Channel of Umasates, though wider has less water; it is however commonly used by large vessels. Each of these two channels is more than two miles wide, and the whole width of the river, including the islands, considerably exceeds five miles. From this point, the breadth begins to increase, and at the mouth, between Punta Barima on the south and the island of Conarejo on the north, it is more than sixty miles wide. The navigable channel, which lies in the middle, is crossed by a sand-bar with several feet of water, in one place, varying from two miles and a half to three miles or a little more. Within the bar the water deepens on the side of the island of Conarejo to four and five fathoms, and the navigable channel is more than twelve miles wide. Though the river ascends from the south, the low country which extends from the Punta Barima to the mouth of the Essequibo river, and is watered by several small streams, is traversed by narrow natural canals called etabeas, which generally lie parallel to the shores of the large navigable streams, and constitute an internal water-communication for small boats between the Orinoco and Pomeroy rivers.

The tributaries of the Orinoco are very numerous, and many of them have both a long course and a great volume of water; being situated on the left bank of the river, they nearly form the whole of their course, and are rarely impeded by rapids; some of them are already navigated. But the rivers which fall into it on the right, originating on the elevated region of the Parima Mountains, descend from them by numerous and rapid watercourses, so as to be, at least for a part of their course, entirely unfit for navigation. We shall only mention a few of them.

The Guaviare rises near 3° N. lat., in the declivities of the Paramo de Sumara, a part of the range of the Andes, and, but for the want of its course is not known. According to information collected from the native tribes which inhabit the adjacent country, this river, like the Orinoco, divides into two branches, of which one running south-east joins the river Meta, and the other, running northwards, the river Orinoco; the Guaviare, so as to constitute another natural water-communication between the two water systems of the Orinoco and Amazon. This branch is said to have been once navigated by a Portuguese, Cabuquena, and is accordingly called the Channel of the Amazon. The Gua-

The Rio Meta, which joins the Orinoco near 6° N. lat., originates with its numerous branches in the Andes east of Bogota, the capital of New Granada, and is said to be navigable for about 100 miles from that town, but it is not used. The most of its channels, by which it discharges the Rio Meta, are navigable, as it originates not far from one of the most frequented mountain-passes of the Andes, that of Tuxillo, which leads to the valley of the Rio Bogomozzo, north of Bogota. English manufactured goods, sent from Trinidad, are carried up the Orinoco, Meta, and Casanare, and over the mountain-pass to Bogota and the adjacent districts. The course of the Rio Meta exceeds 500 miles, and that of the Casanare perhaps 300 miles.

The Rio Pasto joins the Orinoco between 7° and 8° N. lat., likewise from the left, enters it by a great number of channels, and brings to it the waters of innumerable large streams, which partly originate on the eastern declivity of the Andes north of 6° N. lat., and partly descend from the southern declivity of the mountain range. This river receives all the waters which descend from a mountain-range more than 500 miles in length. The Apure itself rises in the Sierra de Merida, and runs more than 100 miles along its base to the south-west, and afterwards from west to east, collecting in its course all the waters which descend from the Andes. Before it joins the Orinoco, after a course of about 450 miles, it enters an extremely low and level country of considerable extent, which for several months of the year is changed into a temporary lake. Through this alluvial country it has cut a number of channels, by which it discharges the Apure waters into the Orinoco, and this the latter is then navigated to Maracay, near the town of the same name.

In these, there is a very considerable distance, from the last-mentioned range unite at one place, a little above St. Jayme, and form a large body of water, which, about thirty miles lower down, falls into the Apure, about fifty miles from its mouth. All these rivers are navigable through nearly the whole of their course, but are not navigated, as they drain the Llanos, a country rich in pasture but without agriculture. The Apure itself however is navigable as far as Junin, near the Rio San Domingo, and the latter is then navigated to La Guajira, near the town of the same name.

Among the rivers which join the Orinoco from the right, only the Caroni requires to be mentioned; it drains a long valley in the Parima Mountains, rising east of the source of the Orinoco, and north of the upper branches of the Rio Meta. It is navigable for short distances, and the Cascarrilla del Angostura (Bomplandiana trifidiata). The Caroni runs more than 300 miles. The whole course of the Orinoco, so far as it is known, is estimated by Humboldt to be nearly 1300 miles, or equal to that of the Ganges.

The tides are perceptible as far as Angostura, or nearly 250 miles from its mouth, in the month of April, when the river is lowest. At the confluence of the Caroni, more than 150 miles from the mouth, the water at that time rises high enough to make navigation quite impossible in the short space of about a month, and dates the greatest part of the Llanos, or plains which lie to the north of it, and likewise a portion of the plains which extend west of its middle course to the base of the Andes. It is immediately after the rains commence. The rising of the water is perceptible: at first it rises slowly, then only at intervals of twenty-four hours, and sometimes the river sinks again in April. It attains its highest level in July, and remains stationary from the end of July until the 26th of August, when it begins to fall, and the lowest stage is attained about the 15th of October; after which it is increased. It is lowest in January and February. At Angostura the mean rise does not exceed twenty-four or twenty-five feet, but in the upper part of its course it rises several feet higher.

ORIOLE (Oriolus) is the name used by Linnaeus and authors generally to designate a genus of Muscipulins, which the reader will find characterised in that article. [Vol. xv. p. 123.]

Wood's and thickets are the haunts of the Orioles; and there they live in pairs, congregating however for their distant journeys, or sometimes even in large parties. The plumage of the males is yellow, and this character is constant in the larger number of species known; the females differ much from the males, their plumage exhibiting greenish or tarnished yellow tints; and the young in early life always resemble the females. Their moulting is simple and orderly.


Example. Oriolus galbula, the Golden Oriole.

SPECIFICATIONS. A black cap; a yellowish brown spot between the eye and the bill; wings and tail black; a yellow spot on the quills, not far from the middle of the wing when closed; and the tail-feathers terminated with yellow; bill redish maroon; iris red; feet bluish grey. Length rather more than ten inches. Mr. Hume agrees with Mr. Yarrell that the male does not obtain brilliant yellow and black till the third year.

Female.—Greenish olive above; greyish white with a yellowish tint below, where the plumage is marked by some rather grayish brown short stripes or dashes disposed longitudinally; wings brown bordered with olivaceous grey,

mountains of Caracas. Almost all the rivers descending from the last-mentioned range unite at one place, a little above St. Jayme, and form a large body of water, which, about thirty miles lower down, falls into the Apure, about fifty miles from its mouth. All these rivers are navigable through nearly the whole of their course, but are not navigated, as they drain the Llanos, a country rich in pasture but without agriculture. The Apure itself however is navigable as far as Junin, near the Rio San Domingo, and the latter is then navigated to La Guajira, near the town of the same name. The Cascarrilla del Angostura (Bomplandiana trifidiata). The Caroni runs more than 300 miles. The whole course of the Orinoco, so far as it is known, is estimated by Humboldt to be nearly 1300 miles, or equal to that of the Ganges.

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Female.—Greenish olive above; greyish white with a yellowish tint below, where the plumage is marked by some rather grayish brown short stripes or dashes disposed longitudinally; wings brown bordered with olivaceous grey,
al diversee tinged with black; yellowish beneath with a brownish black mark, somewhat in the form of an irregular Y; no dark streak behind the bill and the eye.

The Young of the year resemble TL female, but the longitudinal stripes of the lower parts are more numerous and deeper in colour; bill blackish grey and iris brown. Parity, with black spots on a brilliant yellow ground.

This is supposed by Bélon and others to be the Xiphias of the Greeks; 
Galalgus, Vireo, and Oriolus, Lat., and the Pus of Phinny (book x, c. 33) speaks as suspending its nest on a twig of the topmost branches of a tree, after the manner of a cup. It is the Becquigna, Brusola, Gualdine, Carilla, Giallone, and Gravolo gentile of the modern Italians; and Rigogolo commune of the Stor. de' Ucc.; Tarzil of the Spanish; Loriot, Compera Loriot, and Oriol of the French; Gelle Ruche, Gelle Prad, Der Pyrrol, Bredal, &c. of the Germans and Netherlanders; Gout- merle of the Low Dutch; Wittis in of Willughby and Ray; and Paghacel felen of the ancient British.

Habits, Reproduction, &c.—The Golden Oriole is, upon the whole, a shy bird, haunting lonely groves and thickets on the skirts of woods, excepting in the fruit season, when it always frequents orchards, to no small loss of the owner. It is difficult to get near them, though they are sometimes approached by the sportsman under the direction of his imitative whistle; but it requires great accuracy both of lips and ear to perform this fraud, for the least mistake, or one false note, will send the bird off at once. The food consists of insects and their larvæ, berries, and fruits, among which figs, grapes, and cherries are favourites. This whistle of the oriole is loud but flat-like, and Bechstein expresses the sound by the word puholo.

The cup, or rather saucer-shaped nest, is formed of wool and slender grass-stems, and placed in the fork of a branch, usually towards its extremity. The old French quatrain says:

* On dit qu'un homme n'ouvre le nid au trousseau,
  Du Loriot, lequel ne faut pas croire,
  A un ramas, sans ot suspens,
  Voyez pouroyez ce dire en continuant.*

**Golden Oriole.**

The eggs are generally four or five, purplish white with a few saffron and claret spots, and the female watches over them with such maternal care, that it is said she will suffer herself to be taken rather than abandon them. In this country nests have been taken in Suffolk and Norfolk.

Geographical Distribution.—Sweden, where it occasionally breeds; some of the districts of Russia, Germany, Holland, France, Spain, and Italy; Malta (on the southward migration to Africa), Greece, Egypt, Tunis, Tripoli, and the whole north coast of Africa; Trebizond, and Smyrna. In a note to Pennant's British Zoology, by J. L., it is stated that it is common in India under the name of Piluck or Perlick, and that drawings of both sexes were sent from Oude to Lord Valentia; but these were probably specimens of Oriolus auratus so often received from India, a species which, though in some degree like the Oriolus gaulula, is distinct from it.

In our own country the Golden Oriole has been found in Hampshire, Devonshire, Cornwall, near Manchester, near Lancaster, near Walton in Surrey and near Godalming, at

P. C., No. 1941.

Cheshunt (Herts), near Saxmundham in Suffolk, in Norfolk, at Tynemouth in Durham, and in South Wales. It has been seen, though rarely, in Ireland, but never, as far as we can learn, in Scotland.

The bird can only be considered as an occasional visitor in Britain, where it first appears in April, returning in September. The Prince of Musignano states (Specchio Comparativo) that it arrives near Rome in the spring, and departs in the autumn.

Utility to Man.—The Golden Oriole gets very fat after its summer feast of fruit. Willughby saw many of them in the poulters' shops at Naples, and says that 'it hath very delicate flesh, and yields wholesome nourishment.'

**Orion** (Constellation). We have already noted the appearance which the Greek astro-metaphysical system has of being an application of existing fables to a subdivision of the stars derived from the East, mixed perhaps with the Oriental allegories, imperfectly understood. The trivial character of the myths by which the Great Bear and Orion, perhaps the two most remarkable constellations in the heavens, are accompanied, is enough of itself to upset any claim to high antiquity for the system above noted. We owe this brilliant cluster, according to Hyginus (of whose two or three very slight stories this is the most striking), to the fraternal solicitude of Apollo that his sister Diana should remain unmarried, or at least that she should not marry one Orion, a son of Neptune according to some, or of a rather curious parentage according to others. The deity above mentioned, when persuasion had failed, hit upon a method of preventing his sister's match, as follows. He asserted that she could not hit a black object which appeared in the sea at a distance; and she, being a good markswoman, showed him immediately that she could. This black object however was the head of her lover, who was swimming at the time; and the end of it was that, according to custom, he was immediately gazetted as a constellation, with his club and lion's skin.

Orion is surrounded by Eridanus, Canis Major, Gemini, Auriga, and Taurus. The position of his belt, with respect to Ailbebaran and Sirius, and the proximity of Procyon, Castor and Pollux, the Pleiades, &c., renders it difficult to forget and unnecessary to describe this part of the heavens. The list of stars is as follows: **33.**
...were frequently called Belteguese or Beltegeux, and Rigel, corruptions from Arabic names; γ was called Bel-latrix.

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**ORISSA. [HINDUSTAN.] ORISSAN LANGUAGE. [HINDUSTAN, vol. xii., p. 227.]

**ORTHYIA. (Crustacea.) [OXYTOMES.] Orthyia, or Orthia, as it is incorrectly written, is also the name for a genus of Medusarian Polymogrides. [FALMOGRADA.]

**ORIZONTE. The name of this artist was John Francis Von Bloemen, but the Bentvolg Society, consisting of Flemish painters resident at Rome, gave him the name of Orizonte, from the hot and vaporous air of his pictures, it being their custom to give to every new member, on his introduction, a name expressive of any perfection or defect in his figure and countenance, or some peculiarity in his style, or singularity in his character. Orizonte was born in 1636, at Antwerp, but studied and always resided in Italy. The palaces of the pope and of the nobility at Rome possess abundance of his works, both in fresco and oil. The composition of his landscapes and the character of his trees are almost always in the style of Poussin; but the general tone is a dark green with a cast of red. His selection of subjects is always picturesque and the pencilling bold; but his pictures are not always equally finished. As he advanced in age his style degenerated into mannerism, but his originality will always entitle him to a place in the first rank of landscape painters. He died in 1746, at the age of eighty-four.

**ORKNEY ISLANDS, THE. are a group of islands belonging to Great Britain. They are situated north of the north-eastern extremity of Scotland, between 58° 44' and 59° 24' N. lat., and between 2° 28' and 3° 25' W. long. They are divided from the mainland of Great Britain by the Pentland Firth, which is 54 miles wide at its eastern entrance between Duncansby Head and Borough Point in the island of South Ronaldsia. The flux and reflux of the water during the run of the tides through this strait is broken by the Pentland Skerries, which lie a little more than 4 miles to the north-east of Duncansby Head, and 34 miles south of the island of South Ronaldsia; and farther westward by the islands of Swona and Strom, the latter of which lies within 14 miles of the shore of Caithness. A strong current in this produced running at the rate of from three to nine miles an hour in various parts of the Firth at one and the same time; a circumstance which causes so much sea, in gales of wind as to render the strait very dangerous to deep-laden vessels. There are two lighthouses erected on the Great Pentland Skerry, and another on Dunnet Head, on the south side of the western entry to the Firth, with the assistance of which the strait may be navigated with comparative safety in moderate weather.

The group consists of 47 islands and islets, 27 of which are inhabited; the remainder, called holmes, are only visited during the summer for the preparation of kelp or as pasture grounds. The largest of these islands, called Pomona, or Mainland, extends from south-east to north-west, about 18 miles, and forms the greater part of the group into two poms. The islands between Pomona and the mainland of Great Britain are called the South Isles, and those north of Pomona the North Isles. Eight of the South Isles and three Skerries and fifteen of the North Isles are permanently inhabited. They contained in 1837 A.D. a population of 28,847, viz.:—

- South Isles.
  - Swona and Pentland Skerry... 89
  - South Ronaldsia... 2,365
  - Burra... 367
  - Flota and Fara... 363
  - Hoy... 1,288
  - Gremsay... 225
  - Copinsay... 7
  - Pomona, or Mainland... 15,787
  - North Isles.
  - Shapinsay... 809
  - Gairas... 69
  - Weir... 93
  - Egilsay... 228
  - Rousay... 921
  - Enhallow... 29
  - Eda and Fara... 736
  - Stronsa, Papa Storn, and Lingholm... 1,071
  - South... 1,839
  - North Ronaldsia... 522
  - Papa Westra... 330
  - Westra... 1,792

Some of the islands have rocky shores presenting abrupt precipices towards the west, and rise in low rounded hills covered with heath, and with a considerable depth of peat-mould. Others are low and flat, with sandy shores. There are no trees on any of the islands, with the exception of a few of birch in the neighbourhood of the town of Kirkwall; although at some remote period they would appear to have been covered with wood, from the numerous remains found imbedded in the peat mosses.

The geological character of these islands is very simple; the whole group, with the exception of a small granitic district near Stromness, consisting of rocks belonging to the old red-sandstone formation. The prevailing rock is a species of sandstone flag, much charged with argilaceous matter. It occurs in distinct strata, usually slightly inclined, forming hills of small elevation in the island, which however present very magnificent cliffs round the coast. The colour varies from pale greenish to blackish grey. Occasionally it contains bitumen, and it is the repository of remarkable fossil flints.

Connected with the sandstone flag are beds of common sandstone of a yellowish or tile-red colour. It forms the chief part of the mountains of Hoy, the highest peak in Orkney, and also several headlands in Pomona and Eda. Dykes of basalt and greenstone traverse these rocks in Hoy.
Pomona, &c., and a bed of basalt was noticed by Dr. Traill in Hoy.

The granite tract appears in the form of a chain of moderate hills, occupying a length of six miles, and a breadth of from one to two, but mostly about one at Stornoway. It is everywhere in immediate contact with a coarse conglomerate, consisting of nodules of quartz, and fragments of granite and sandstone, imbedded in an arenaceous base.

The granite, conglomerate, and sandstone flag, above noticed, resemble the rock layers in Caithness and Sutherland. Cottages occur rather plentifully in Pomona, in the lower beds of a quarry of sandstone flag. The fisher spin out from Caithness and Orkney approach another one very nearly, but among the latter are several new species and the most remarkable is a large monk fish, named by Agassiz, Cheilurachus and Cheirolophus. (Traill and Agassiz, Reports of the British Association for 1834.)

According to a rough estimate, the surface of the islands is 150,000 acres, of which less than one-third is still used as pasture; the remainder is a waste or covered with water. The island of Sands, which is flat and low, is the most fertile, and accordingly is called the granary of the Orkneys. Watt Hill, on the island of Hoy, has eleven acres, and is the site of a fishery and an old church.

The soil of some of the islands is of inferior quality, but that of others is excellent. Agriculture is limited to the raising of oats, and that kind of barley which in Scotland is called barley, or big, and to the cultivation of potatoes, turnips, and occasionally wheat. Fishermen and crofters having had their attention for many years exclusively to the kelp manufacture, agriculture has been greatly neglected; but of late great improvements have taken place, and the opening of a regular steam communication with Aberdeen and Edinburgh has given a great stimulus to the raising of green crops and rearing of cattle, for which the islands are peculiarly adapted. Owing to the wetness of the climate and the lateness of the summer, wheat is not found. The most common crop is turnips, which are exported in considerable quantities. Cattle are numerous, but small: on several of the larger farms the Angus and short-haired breeds have been introduced with success. Horses are abundant, but small. Sea-fowl abound on most of the smaller islands. Many families upon which the produce of their fishing; cod, herrings, and lobsters abound along the coast, and seals are common. It has been conjectured that the islands derive their name from the seal, orc, in the language of the Northmen, signifying a seal.

Kirkwall, situated on a bay on the north coast of Pomona, is the capital of the islands. The cathedral of St. Magnus at Kirkwall is one of the most remarkable specimens of middle age architecture in Scotland; it was built by Olive, King of Denmark. It is in considerable repair and still used as the parish church. Close to the cathedral are the ruins of the bishop's palace, and of the palace of Earl Patrick Stewart, the last feudal earl of Orkney, who was executed for high treason in the reign of James I. The town consists of one long street, but there is little good accommodation. The town has been recently lighted with gas. The population in 1831 was 3721. It has ten schools and a considerable trade in the produce of the island. In 1835, 78 vessels, of 4238 tons, were registered, and in 1836, 94 vessels, of 5326 tons. In 1835, the shipping which left the port amounted to 9248 tons, and 10,304 tons entered. The town has some distilleries.

Stromness, situated towards the south-western extremity of Pomona, has also a good harbour. It contained in 1831 a population of 1491, and it has considerable trade: about 300 vessels annually enter the harbour.

Though there are several other good harbours, they are not used, except by fishing-boats; the best in Orkney is Inganess Bay for all classes of vessels. The principal stations for the herrings-fishery are St. Margaret's Hope in South Ronaldsay and Stenness in Stronsa. On the island of Hoy there was a great extension of agriculture, and the rise of the herrings-fishery, which had been entirely neglected, into a branch of industry of great importance. Upwards of 700 boats, with six men each, and of the average value, with their nets, of 60l. or 140l. each, are now engaged in the herrings-fishery, and the number is rapidly increasing. In favourable years, over 30,000 to 50,000 barrels of herrings are exported, and from 20,000l. to 30,000l. are divided among the fishermen and their families. The cod-fishery also, which is prosecuted in the winter, is almost as important. The herrings occur on the coast, is fast rising into importance, and already brings from 5000l. to 7000l. annually into the country. The lobster-fishery is also carried on, but is of minor importance.

The inhabitants are of Scotch and partly of Norwegian descent. While the islands belonged to Norway and Denmark, many Norwegians settled on them, and their language was exclusively in use. But since the islands have been annexed to Scotland, a great change has taken place, and the Norse language has been long extinct. A few relics of the Udal tenure, the universal tenure of land among the free nations of the north, may still be found; and there are instances of families who occupy small tracts of land which have descended from father to son; but from time immemorial. In character, the inhabitants of these islands now differ little from the Scotch lowlanders. They are generally intelligent, educated, and moral. The competition between the United States and Canada, which has extended in part to the population, and the established church, has done much of late years to extend the means of education and diffuse a spirit of religious zeal. There are a few parishes which have not at least two schools. The women find some occupation in straw-work, &c. and in preparing the fishing gear. A growing interest in national events is apparent, and a spirit of patriotism is manifesting itself. It was a mark of respect for the merchant, and often rose to be masters and mates of vessels, being in general sober, honest, and able to read and write. Formerly a considerable number went to America in the service of the Hudson's Bay Company, and it is now engaged by the North West Company with the North-West Company. Canadians have been exclusively employed. A few men also go every year with the whale-ships to Davis's Straits, but, owing to the rapid increase of the herring and cod fisheries of late years, the number who leave the islands in search of employment is considerably diminished.

It appears that the Orkneys were early taken possession of by the Normans, and they remained subject to the kings of Norway and Denmark, but had their own kings or earls, who governed them as independent soveraigns. The Orkneys were the general rendezvous of the piratical fleets which so often devastated the coasts of England and France. Rollo, the conqueror of Normandy, and afterwards Duke of York, was born in Orkney. In 1468 the islands were pawned to Scotland for 50,000 florins, and the pledge has never been redeemed. From the year 1471 the earls of the island became dependent on Scotland, and from that time were considered like the other chiefships of the Scottish lords. The Hope of South Ronaldsay, and the Earl of Orkney, have always been their lord and master.
is an excellent and spacious harbour, called Long Hope. The steevry of Orkney and Shetland, consisting of this group and the Shetland Tales, sends one member to parliament, and the town of Kirkwall, which is a royal borough, returns a member together with Wick, Dingwall, Tain, Cromarty, and Dornoch.

(Peterkin's Isles on Orkney and Zetland; Neil's Tour on Orkney and Zetland; Stanley's Voyage to the Orkneys; Sheriff's Agricultural Report of the Orkneys; Various MS. Communications.)

ORLAY, BERNARD VON, called Bernard of Brussels, born in that city about the year 1160, and died young, where he had the good fortune to become a pupil of Raphael. On his return to Brussels he was appointed principal painter to the government of the Netherlands, and was likewise employed for many years by the French king and his successors, in which he introduced portraits of Charles V. and the nobles of his court, he usually took the scenery from the forest of Soignes, which afforded him ample variety.

He was engaged by the Prince of Nassau to paint sixteen canvases of his family, tapestry, intended to decorate his palace. Each canvas contained only two figures, a knight, and a lady on horseback, representing some members of the Nassau family. These canvases were designed in an elevated style worthy of a pupil of Raphael. The canvases were copied and sold by the artist to princes of his own time. The painting of a monastery at Antwerp had a celebrated picture of the Last Judgment by this master: we are not certain whether it is still there, or has been lost or destroyed in the scenes of revolution and confusion in the last half-century. B. von Orlay died in 1580, aged seventy.

As this artist is, we believe, little known in England, we subjoin a few brief notices from Dr. Wagner's 'Arts and Artists' (in the translated copies of the original, which he sends to English collectors): 'In Devonshire-house, Neptune and Amphitrite, and Cupid with the trident, a very carefully executed little picture, here ascribed to Luca Penni, but, beyond all doubt, a work of that Flemish scholar of Raphael.' A fresh portrait, very finely painted, kept under glass, and, without any reason, said to be Petrarch's Laura; 2, a female figure in profile, called Cleopatra, on a serpent on the bosom; but the expression of indifference in the fine and handsome face does not correspond. In the state rooms of the late Lord Ashburton, in Holy Family, admirably executed, after a composition by Leonardo da Vinci. At Chatsworth: the Presentation of the Virgin in the Temple, a very rich composition, ascribed to Jan van Eyck; but many parts of which, says D. Wagner, are now in the Museum of the Academy in Rome. At Kedleston Hall, the seat of Earl Scarsdale: the Virgin with the Infant Christ, who blesses St. John in the presence of Joseph and Elisabeth: the figures are three-quarter figures of the size of life. Dr. W. says that next to the Potia, in the museum at Brussels, this is the finest figure that he was acquainted with by this eminent master. At Lord Spencer's, at Althorpe: a bust of Anne of Cleves, very carefully painted.

ORLEANS, or ORLEANS, L', one of the provost, or military governments into which, before the Revolution, France was divided. It was bounded on the north and east by the government of L'Ile de France, on the east by Champagne and Bourgogne, on the south-east by Languedoc and Provence, on the south by Touraine, and on the north-west by Maine and a small part of Normandie. It took its name from Orleans, its capital [ORLEANS], and comprehended the subordinate districts of Orleans, properly so called, chief town Orleans, pop. 60,161; Le Chateau byinis [CHATEAUDUN], chief town Montargis, pop. 6781; Le Blaisois or Blaisois [BLOIS and BLOIS], chief town Blois, pop. 13,138; La Sologne, chief town Romorantin, pop. 6985; and Le Beauce or Beauce [BREUSES], which comprehended the three districts of Le Pays Chartrain [CHARTRES], chief town Chartres, pop. 14,439; Le Dunois [DUNOIS], chief town Chateaudun, pop. 6461; and Le Vendois, chief town Vendome, pop. 7771. The province of Orleans is now divided into the departments of Eure et Loir, Loir et Cher, and Loiret. Some portions of it are included in the departments of Nièvre, Saône-et-Loire, and Yonne. It included the three bishoprics of Orleans, Chartres, and Blois, all of which still exist. The bishops are suffragans of the archbishop of Paris.

Orleans was closely connected with Beauce on the north, north-west, and west, Orléanais on the north-east and east, Sologne on the south, and Blois on the south-west. It comprehended, besides Orleans, the towns of BecanUFFIX (BIS) or BEACON (BIS), pop. 4893; Châteauneuf, pop. 3160; St. Alban-aux-Bois, pop. 4987; and Fontaine, pop. 2987. It is at present included in the department of Loiret, except a very small portion which is in the department of Eure et Loir.

The district of Orleans, in the wider application of the term, was for the most part included in the country of the Loire valley, in the region of the Canais, or Quarta, or Sononia; a portion of it was included in the territory of the Senones, in the same province: both these were Celtic nations. It was one of those parts of Gaul which remained longest in the hands of the Romans; but the command of two successive Saxons, Clovis, it fell into the hands of the Franks.

The part south of the Loire was probably already in the hands of the Visigoths, from whom it was soon after taken by the Franks. It was probably included in the kingdom of Orleans under the sons of the Visigoths, or the Franks of the same name. Part of it at least was included in the domains of Hugues Capet, before his accession to the throne of France, upon which event it became part of the domaine royal.

ORLEANS, in France, capital of the department of Loiret, situated on the right bank of the Loire, 65 miles in a direct line south by west of Paris, or 71 miles by the road through Montbèthier, Etampes, and Artenay; in 47° 55' N. lat. and 4° 32' E. long.

Orleans is a town of considerable antiquity. We are of opinion, with D'Anville, that it was the Genabum of Cesar, in opposition to the opinion of those who would fix Genabum at Gien. (See art. 'Genabum,' in the 'Index Geographicus,' p. 286.) It was an important place, and held the title of a civitas of the Gauls, or of the Gauls-Celti, or of the Gauls-Cereticus, or of the Gauls-Castor. In 58 B.C. it was the seat of the Roman army under Caesar, and was the scene of the battle of the Avenzois, in which the Romans under Cæsar defeated the Gauls under Ambodivarius, in the winter of 49 B.C. (see art. 'Cesar.') It was the scene of the battle of Poitiers, in which the army of the Roman emperor, Julian, was defeated by the army of the Gothic king, Theodosius, in the year 367. It was the scene of the battle of Poitiers, in which the army of the Roman emperor, Julian, was defeated by the army of the Gothic king, Theodosius, in the year 367.

The modern name Orleans is obviously derived from Aurelian, or, as it was written in the middle ages indeclinably, Aurelianis.

In the devastating invasion of Atilla (A.D. 451) that barbarian penetrated as far as Orleans, which he besieged. The town had been strengthened with new fortifications, and was bravely defended by the town council. The latter was relieved by the timely approach of the Romans and Visigoths under Actius and Theodoric. Orleans subsequently passed into the hands of the Franks, and became capital of the county of Orleans. In the time of Charlemagne, the accession of Hugues Capet, who had inherited that duchy, became one of the most important places in the immediate dominion of the crown. It was at a later period (A.D. 1428) besieged by the English under the regent Bedford (BEDFORD, JOHN; DUCHE OR), but the siege was the limit of their ambition. They were obliged to raise it with disgrace, and never after recovered their superiority. [ARC, JEANNE D'.] At this time the town gave the title of duke to a branch of the house
of Valois, which afterwards came to the throne in the person of Louis XII.

In the religious wars of France in the sixteenth century, the prince of Condé, leader of the Huguenots, the struggle possessed himself of the town of Orléans (April 1562). In less than a year (February, 1563) it was besieged by the duke of Guise at the head of the Catholics; but his assassination (GUISE or GUYSE, DUKES or) prevented the capture of the town. The head of St. Bartholomew (a.d. 1572) a number of Huguenots, variously stated at from 800 to 1800, perished at Orléans.

The town stands in a plain gently sloping down to the river: the circuit of the ramparts, now converted into a promenade, forms an arc of a circle about two miles and a half to three miles in extent. The side of the town along the bank of the Loire, presenting the church, is about a mile and a half, and the length of the principal line of street from the entrance of the Paris road to the bridge is on the north side to the bridge over the Loire, nearly perpendicular to the church, is about three-quarters of a mile. Orléans is surrounded by numerous country-houses, and has large suburbs, of which that of Olivet (not to be confused with the small town of New Orleans in Louisiana) is perhaps one of the handsomest in the world. Some parts of the town are well laid out, with wide and clean streets and well-built houses. The line of street from the Paris road to the bridge is on the whole the finest, especially that part which lies between the statue of St. Charles and the bridge. The bridge over the Loire is above 1000 feet long, and consists of nine arches, of which the centre has above 100 feet span. There is a tolerably handsome quay near the bridge; and between the bridge and the suburb of Olivet is a public walk. This suburb abounds with country-houses and with nurseries.

The cathedral of Sainte Croix is one of the finest in France. It was rebuilt after its being ruined by the Huguenots. The rebuilding was commenced by Henri IV., but it was never finished (if indeed it be yet completed) since the restoration of the Bourbons. The architecture has excited much admiration, especially that of the principal entrance; and the two towers of the front are among the finest examples of the best Gothic architecture. The church of St. Aignan, the finest except the cathedral, is a beautiful Gothic building, but is imperfect. The nave was destroyed by the Huguenots, and the steeple was demolished not long since. The church of St. Pierre le Puellier, the oldest in the town, is remarkable only for its antiquity. There are a town-hall; a court-house (Palais de Justice), a handsome modern building; a building in which is deposited the public library of above 20,000 volumes; and a plain theatre. The botanical garden is little more than a public walk.

The population of Orléans in 1831 was 40,181; in 1836, it was 40,372. The commercial prosperity of Orléans is not equal to what it formerly was. Its refining-houses for sugar were more busily engaged before the rise of this branch of trade than now; and there is some evidence of a renewed industry. Trade to the Levant has also declined. The preparation of vinegar, the bleaching of wax, are still actively carried on; and blankets and cotton counterpanes are manufactured. To these articles may be added the manufacture of woollen cloths, flannels, harts, flax, flax-rams, and other tools, glue, chamois and other leather, tin, and earthenware. There are breweries and dyeworks; and round the town are numerous nursery-gardens. The neighbourhood is well supplied with excellent wines. Trade is carried on in the above articles, and in brandy, corn, flour, wool, saffron, firewood, timber, planks, coals, groceries, and spices. The navigation of the Loire, and the communication with the Seine and its branches by means of the canals of Orléans and the Loing, contribute much to the trade of the place.

There are a Cour Royale and several other judicial and fiscal government offices; an exchange, a chamber of commerce, and other institutions connected with trade; an Académie Universitaria; a society of sciences, belles-lettres, and arts; a royal college or high school; free schools for drawing, architecture, &c.; a museum of natural history; and two large libraries.

Orléans is the seat of a bishopric, the bishop of which is a primate of France; a duchy of Orleans: the grand-duke of Orléans was restored to the king in 1856.

The arrondissement of Orléans comprehends an area of 929 square miles, and includes 106 communes: it is divided into fourteen cantons, or districts, each under a justice of the peace.

The population in 1831 was 137,800; in 1836, it was 141,637.

ORLEANS NEW, the capital of the state of Louisiana, is situated on the eastern bank of the Mississippi, 104 miles from its mouth following the course of the river, and about 90 miles in a direct line from the Gulf of Mexico; at 39° 58' N. lat. and 90° 0' W. long. The city is in the most favourable situation for the prosecution of the trade of one of the most important parts of the North American Union, being near the mouth of the great outlet to the valley of the Mississippi. New Orleans may become the greatest commercial centre of the West; the present place in Europe or America which has equal natural facilities of internal navigation. The rapidity with which the population and commerce of the city have increased during the last 30 years, and especially since the Mexican war, in which western Louisiana was bought by the United States from France [JEFFERSON], the number of inhabitants did not exceed 10,000. New Orleans was founded by the French in 1717; it was ceded to Spain in 1765, with the rest of Louisiana; but was re-established to France in 1801, and purchased by the United States in 1803.

The French language is perhaps as much spoken as the English. The principal theatre is French; it is in the old French style, and is a magnificent structure. There are a number of hotels in the suburbs. Billiard-rooms, gambling-houses, and lottery-offices are in great numbers, especially in the old town. Some of the newspapers are in English, some in French, and some are half in English and half in French.

New Orleans is built in the form of a parallelogram, consisting of six complete squares, with suburbs, called faubourgs. The streets in the old city are about 40 feet wide; many of them are unpaved, but have wide and convenient footpaths. The houses near the river are of brick, but in the centre of the town they are built of wood. During the hottest months of the year the city is exceedingly unhealthy, and many of the wealthier inhabitants leave it at that season; of those who remain, a large proportion are carried off yearly by yellow fever. The climate of New Orleans is as favourable for Europeans as for natives; and perhaps in addition to the insalubrity of the place, we must take into account the dissolute mode of life of many of the inhabitants as one cause of the great annual mortality. The city is one of the most pleasant in the United States, being bounded on the south by the Mississippi, which extends for nearly 100 miles along the bank. The sickly season extends through the months of July, August, and September. The musquitoes are in vast numbers. Every bed in every respectable house is provided with a musquito-net.

The cathedral is the only public building at all imposing; it has four towers, and massive walls ornamented with
figures of saints in the niches. There is a large 'Charity Hospital,' which provides liberally such articles as are needed by the sick poor, and relieves every year from 5000 to 10,000 patients. There are also three orphan asylums for supporting, educating, and putting out in the world destitute orphans; two of these institutions are well endowed, and the whole are well supported by the richer inhabitants.

In the environs, there are large plantations of sugar, cotton, and rice, which are cultivated in a very perfect manner. There are pomegranates, magnolias, myrtles, and the fragrance of the orange groves, when the trees are in blossom, is delicious.

A canal, opened in 1837, connects New Orleans with Lake Pontchartrain. It is 44 miles long, and cost nearly a million of dollars. Another canal, called the Carougelet canl, connects the Mississippi with Lake Pontchartrain through the river St. John. La Carougelet Canal extends from near New Orleans to Berwick's Bay, the length, including the natural navigation, is 65 miles. A railroad, 44 miles long, connects New Orleans with Lake Pontchartrain. This work is perfectly straight, and with a difference in the level of only 16 inches throughout: it has cost half a million of dollars, and produces an adequate revenue.

At the terminus of this line on Lake Pontchartrain, an artificial harbour and breakwater have been constructed. The Carrolton railroad connects the city with Carrollton, 6 miles distant, and with Lafayette, 2 miles distant. The tire length of the main line and branches is 114 miles: this work has been very profitable to the projectors. A third railroad, 1/4 mile long, connects New Orleans with the Bayou St. John. Several other lines of railroad are in progress.

New Orleans is supplied with water by a public company, which has laid down 12 miles of pipes. The water is pumped from the river to a reservoir 30 feet high, where it is allowed to settle, and is thence distributed through the city. The city water works is another establishment, used in the hot season only to supply water from the river and to convey it in open channels through the streets. A draining company has erected two steam-engines for draining the swamps between the city and Lake Pontchartrain, by which means an extent of about 35 square miles has been reclaimed with great advantage to the adventurers and benefit to the health of the inhabitants.

The shipping, registered and enrolled, that belonged to the port of New Orleans, in 1836, were of the burthen of 58,710 tons. The vessels that entered and cleared in that year were as follows:—

<table>
<thead>
<tr>
<th>Entered.</th>
<th>Cleared.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ships, Tons.</td>
<td>Ships, Tons.</td>
</tr>
<tr>
<td>American</td>
<td>906.7</td>
</tr>
<tr>
<td>Foreign</td>
<td>210</td>
</tr>
</tbody>
</table>

Total | 713 | 146,127 | 822 | 193,948 |

The import and export trade of the state of Louisiana, nearly the whole of which is carried on at New Orleans, was, as follows, in the year ending 30th September, 1838:—

<table>
<thead>
<tr>
<th>Imports.</th>
<th>Exports.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dollars.</td>
<td>Dollars.</td>
</tr>
<tr>
<td>In American vessels,</td>
<td>Domestic produce.</td>
</tr>
<tr>
<td>Tons.</td>
<td>7,342,614</td>
</tr>
<tr>
<td>Foreign do.</td>
<td>5,077,534</td>
</tr>
</tbody>
</table>

Total | 9,496,808 Total | 31,502,248 |

The greater part of the domestic produce exported consisted of cotton.

New Orleans is distinguished for the courageous and successful defence which it made against the English in January, 1815. The English were commanded by Sir Edward Pakenham; the American defence was conducted by General Jackson. The breaking of the boats on the wharves at the city, and strengthened by baies of cotton, which were brought in great quantities. Behind these cotton-bags General Jackson placed picked riflemen, each of whom had over three thousand bullets to load his rifle. The English were first exposed to a terrible fire of artillery within half cannon shot, and afterwards to the rifles and small-arms of the Americans. The British are understood to have had between 10,000 and 12,000 men in this engagement, and the Americans between 2000 and 4000. The British lost between 3000 and 4000 men; the Americans had only six or seven wounded. Sir Edward Pakenham was killed.

ORLEANS, HOUSE OF, the title of a branch of the royal family of France, which has three times originated in the younger son of a king, and has twice obtained possession of the crown.

I. The first House of Orleans sprang from Louis, second surviving son of Charles V., the earliest prince who aspired to have borne the title of Duke of Orleans, and who, after playing a conspicuous and not very creditable part in the troubles, after the disgrace of the imperial jaeger Charles VI., was assassinated at Parma, in 1407, by his cousin and rival John, son-in-law of John, Duke of Bourgogne. The results of this crime were most disastrous to France, which was filled with violence and bloodshed by the conflict of the two factions of the Bourbons and Armagnacs: the Orleans party being distinguished by the latter title, from their leader, the count of Armagnac, who, as father-in-law of the young duke of Orleans, undertook to protect his cause, and avenge the murder of his father. The history of the first duke of Orleans is also memorable for his marriage with Valentina Visconti, daughter of Gian Galeazzo Visconti, duke of Milan, which eventually gave the house of Orleans pretensions to that duchy, and produced the Italian wars of Louis XII. and his successors for the possession of this title.

The life of Charles, second duke of Orleans, was remarkable chiefly for his having been taken prisoner by the English at the battle of Azincourt, in consequence of which he served a long captivity, together with his younger brother John, in the castles of Compiègne, Dunois, and famous 'Bastard of Orleans,' and progenitor of the house of Lon- guelle, was his illegitimate brother.

Louis, son of Charles, and third duke of Orleans, was executed during the reign of Louis XIV., on the caprice of that gloomy tyrant, whose deformed daughter Jane he was compelled to marry: but on the death of Charles VIII., and the failure of the direct line of Valois, in 1498, the duke of Orleans succeeded to the crown by the title of Louis XII. On his own death, without male issue, in 1515 [Louis XII., his cousin Francis, count of Angou- lême, to whom he had given his daughter Claude in marriage, ascended the throne, under the title of Francis I.]; and the royal succession thus devolved upon the second branch of the House of Valois, the line of Orleans, Angoulême, as it has been called—which contributed five sovereigns to France, viz. Francis I., Henry II., Francis II., Charles IX., and Henry III.

The following table will show the descent of the first house of Orleans.

<table>
<thead>
<tr>
<th>CHARLES V. LE SAIGN</th>
<th>1259</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHARLES VI.</td>
<td>1422</td>
</tr>
<tr>
<td>CHARLES VII.</td>
<td>1461</td>
</tr>
<tr>
<td>LOUIS XI.</td>
<td>1453</td>
</tr>
<tr>
<td>CHARLES VIII.</td>
<td>1484</td>
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</tbody>
</table>

Claude, married FRANCIS I. and 1547. to Francis I.

II. The only prince of the second house of Orleans was Jean Baptiste Gaston, the younger of the two sons of Henry IV. and Maria de Medicis, who was born in 1608, created duke of Orleans in 1626, and died in 1660. Of a vain and unquiet, weak and heartless character, his life was a series of troubles and disgrace, which were caused principally by his own misconduct. During the reign of his brother Louis XIII., he was continually engaging in intrigues and plots against Cardinal Richelieu; and, on their failure, purchased safety by his own humiliation and the base sacrifice of his unhappy accomplices. In 1626 he countenanced a plot against the life of the cardinal; and, on its detection, abandoned the Count de Chalais, one of the principal officers of his household, to the disgrace of the minister, who had his head struck off. Five years later, Gaston retired from court on some new quarrel
with Richelieu, increased the displeasure of his brother by contracting a marriage with Marguerite, sister of the Duke of Lorraine, and finally withdrew into exile at Brussels, leaving his adherents again exposed to the persecution of the cardinal. At length, he re-entered the kingdom in October, 1701, with the royal authority, but persevered in hostilities only until he was seriously wounded at the battle of Castelsarrady, in which his principal partizan, the Duke of Montmorency, was made prisoner: when he obtained pardon for himself, without security for his captive friend, who was bought by the royal bounty. Gaston, indeed, on this catastrophe retired again in terror to Brussels; but with his usual levity he was, after some time, induced to abandon his Spanish protectors and return to the court. Being entrusted with the command of an army against the Spaniards in Austria, was taken by surprise on the field of the Count de Boissons, another plot to assassination the cardinal, caused the failure of the design by his irresolution, and on its exposure fled to Blois, but was soon after again reconciled with the court. The birth of a son to Louis XIII., by his wife Marie de Margin, Duchess of Orleans in the state; and he fell into comparative obscurity for some years, until, in 1642, it was discovered that he had entered into a treasorable treaty with Spain, for the subversion of the monarchy and the massacre of the regent. Gaston retired to his private house, according to his custom, by the most abrupt submission, and by betraying his accomplices, among whom the young Marquis de Cinq Mârs, a favourite of Louis XIII. himself, and François Auguste de Tho, son of the intendant of Champagne, who was on terms with Gaston himself, on this occasion, did not escape without the loss of the honours due to his birth. He was deprived of his guards and his principal domains, and banished from the court. But the death of Richelieu and of Louis XIII. showed that the monarchy was in no wise destitute of the regent. Gaston was appointed to the post of lieutenant-general of the kingdom, under the regency of the queen mother, Anne of Austria. He gained some credit in the campaign of 1644 against the Spaniards, and for a time supported the government in the person of the minister Cardinal Mazarin. But the absurd commissions of the Provençal soon tempted the characteristic levity of Gaston; and he allied himself, against the court and Mazarin, to the interests of Condé and the parliament of Paris. The latter body were moved by his cabals, though Louis XIV. had now attained his majority, to appoint him a new lieutenant-general of the kingdom, as the same title had been factiously conferred on the Duke of Montmorency, by the people, to unbend the regal and political pride of Mazarin and the close of the civil wars produced for Gaston the usual fruits of his vacillation and perfidy; and in 1652 he was banished from the court to Blois, where he passed the remaining eight years of his life in mortification and idleness.

Gaston had no male issue; but he was the father, by his first marriage, with the heiress of Montpensier, of the princess who inherited that title, and who figured so conspicuously in those strange political scenes of her times, of which she has left her own memoirs. Louise de Montpensier, known among her contemporaries as "La Grande Mademoiselle," merited that designation as much by her aspiring character as her illustrous birth. She shone conspicuously in that galaxy of high-born French women who, more distant from the great world, yet less remote from it, saw the varying fortunes of virtue, of state, and of private life, and passed through the political storms of the Fronde. While heroes and statesmen bartered their honour and policy for the smiles of beauty, while fortunes and issues of war were shaped and broken with lovers' vows, these female warriors and politicians openly appeared in the camp and at the council. Gaston of Orleans, in a style as much serious as burlesque, addressed a letter to Mesdames the Dauphins, to the end of the death of the Duc de Bourgogne, and daughter against Mazarin." With more boldness than her father, the Grande Mademoiselle showed her prowess by turning the guns of the Bastile against the royal troops to recover the retreat of the forces of Condé. "That discharge had been plaques between the army advancing and the known anxiety to expose her cousin, the young king Louis XIV., whose regard was for ever alienated from her by this outrage. After having aspired to be queen of France, and having refused the hand of several other sovereigns, Madeleine de Montpensier finished, at the mature age of forty-four years, by desiring to raise a private nobility to the Count de Lauzun, to the rank of her husband and the title of duke of Montpensier. Louis XIV. first granted and then unkindly retracted his consent to the union; notwithstanding which it was privately concluded in 1670, an offence for which Louis XIV. suffered a ten years' imprisonment. After she had obtained his release, by the sacrifice of her finest domains to a natural son of the king, the princess found her marriage neither recognised at court nor happy in itself; and she closed, in 1693, a life of strong affections, embittered by the disappointment both of political ambition and personal affection.

III. The progenitor of the third and existing House of Orleans was Philip, second son of Louis XIII., and Anne of Austria, who was created Duke of Orleans, on the death of his uncle Gaston, in 1660; and succeeded to the dukedom of Montpensier, by the bequest of La Grande Mademoiselle, in 1693. His career was by no means distinguished: but he is said to have had some taste for letters; and he died a natural death, in the midst of the most glorious campaigns of the reign of Louis XIV. He was twice married; first, to his cousin Henrietta of England, daughter of Charles I., and, like himself, a grandson of Henry IV.; and secondly, to Elisabeth of Bavaria, the daughter of Charles VI. of Austria. The death of Philip attended the sudden death of his first wife, a princess celebrated for personal graces, in the flower of her age, cast upon him the horrid suspicion of having poisoned her: a charge however apparently unfounded in itself, as the marriage Philip had, besides a prince who died young, and a daughter, the son, of his own name, who, on his death in 1701, succeeded him in his titles.

This was the celebrated Regent Orleans, of whom Voltaire has described, for his dissipation, his idleness, and his pleasures, he was born for society even more than for public affairs, and was one of the most amiable men that ever existed. The severer judgment of history has branded the memory of Philip II., duke of Orleans, with the reproach of unbridled and political pride, his domination of Mazarin, and the fatal example both of his private life and public administration—encouraged that corruption of morals in France, which, becoming aggravated throughout the licentious reign of Louis XV., unquestionably produced the worst excesses of the Revolutionary period. By his love of public and private honours Orleans with great abilities; but his mind was early taint "by the lessons of his tutor, the able and infamous Dubois, who was afterwards, under his regency, a cardinal, his favourite, and prime-minister. Philip was a proficient in many sciences and accomplishments, in mathematics, in poetry, music, sculpture, and painting. He had like-wise in his youth displayed considerable talents for war, and some ambition to attain equal distinction in arts and arms. He was employed on the behalf of Philip, his own cousin, at the battles of Steinkurche and Neuenrieden, commanded the French armies with courage and activity in Italy and Spain during the Succession War, and in the latter country established so much reputation and influence, that he was said to have been sent into England to design a suppliant to Philip V. on the throne of that kingdom. This and other causes of jealousy led Louis XIV., in anticipation of his great-grandson's minority, to mediate the exclusion of Philip of Orleans from the regency. But this plan was frustrated by the march of events. The progress of this plan: the duke quietly possessed himself of the government, and grieved as were the vicissitudes of his administration, he was guilty of no ambitious attempt to abuse the rights of the young king. His influence was thus limited, as the young king completed his fifteenth year; and a sudden death terminated his career in 1723. He had been married during the life of Louis XIV.-to Françoise Marie de Bourbon, styled Mademoiselle de Blois, natural daughter of that monarch and Madame de Montpan,\n
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by whom he had one son, born in 1703, and several daughters.

Louis duke of Orleans seemed at first disposed to emulate the vices of his father, whose better tastes for letters and sciences impressed him. But his marriage with a princess of Baden, to whom he became tenderly attached, weaned him from early habits of dissipation; and her premature death, in 1726, affected his mind so deeply, that he withdrew from the world to a monastery. In this retreat he divided the latter part of his life between works of charity, religious exercises, and literary studies; and here, in 1742, he closed an existence dignified with every virtue that could adorn a recluse. Louis left a son and daughter, of whom the former, Louis Philippe, born in 1725, who was subsequently the father of the famous Louis Philippe, was remarkable only for his military service, in the early part of which he fought with gallantry at the battles of Dettingen and Fontenoy, and subsequently in some of the affairs of the Seven Years' War. He married a princess of the House of Conti, by whom he had a son and a daughter, and died in 1785.

Louis Philippe Joseph, the only son of the last duke, who was born in 1747, and known during his father's life as Duke de Chartres, became afterwards more unhappily distinguished as Duke of Orleans of the National Assembly, the Louis Egalite of the Convention, the instrument, and the victim of the French Revolution. Naturally gifted with a handsome person and superior talents, he had figured both mind and body by a youth of debauchery; and it was his infamous and infamous proclivities at the court of Louis XVI. to a contempt which he bore well repaired with deadly hatred to the person and family of that monarch. In the year 1778 he was present in the naval action between the squadron of Admiral Kessel and the Spanish Cape of Good Hope; and he was accused of having behaved in that engagement with such shameful cowardice, that, instead of receiving the advancement to which he aspired in the sea service, he was appointed colonel-general of the Marine, a post by consequence with the intention, as it was said, of covering him with ridicule. Having, in 1785, succeeded to his father's title, he eagerly entered upon a political career, of which it seems to have been the object, by acquiring popularity, to reach power upon the crown and to raise himself into power. He proved himself however utterly destitute of the qualities of a revolutionary leader, and was soon overwhelmed in the political tempest which he endeavored to direct. At the commencement of the Revolution he argued himself on every occasion with the royal authority: during the progress of events which raised the Jacobin party into power, he became their associate and dupe; to render homage to their opinions as a member of the National Convention, he solicited and obtained permission to renounce the title of his family, Louis Egalite; and finally, after having voted for the death of Louis XVI., he was himself dragged to the scaffold towards the close of the year 1793. He was married to Louise Marie de Bourbon-Penthievre, grand-daughter of France, by whom he left one son, the present King of the French, and a daughter, styled Mademoiselle d'Orleans.

(L'art de verifier les Dates; Sismondi, Histoire des Francais; Memoires d'histoire de Montpensier, Voltaire, Memoires de Louis XIV. et XV.; Thiers, Histoire de la Revolution Francaise, &c.)

ORLOFF, G. [PETER III. OF RUSSIA.]

ORMOND, the name of a large territory in the Irish confederate counties, and from the French title of a noble house, so ancient and illustrious, that its origin has been, perhaps fancifully, ascribed to the ducal blood of Normandy, before the conquest of England. But it is certain that this family, having become established in Ireland, and deriving its origin by marriage, in that country from several noble intermarriages, was recognised in that country, from the very beginning of the thirteenth century, as holding the hereditary office of royal cup-bearer or butler. From which, with the time, or at least, it is said, that no greater number of airships appears to have been derived. Edmund le Butiller was raised by Edward II. to the earldom of Carrick; his son James, who espoused Eleanor Bohun, granddaughter of Edward I., was created by Edward III., earl of Ormond; and the issue of that marriage, a second James, called, from his royal descent, 'the noble earl,' filled the dignity of Lord Justice of Ireland, the government of which kingdom was administered under various titles by several of his descendents.

The distinguished individual however of the race was JAMES BUTLER, DUKE OF ORMOND; justly described as ' one of the ablest of his age, most accomplished courtiers, and worthiest persons of the age in which he flourished.' He was born in London in 1610; and, notwithstanding the splendour of family dignities which he was destined to augment, his youth was passed unusually to have obscured the career of a less energetic spirit. His grandfather, Walter, earl of Ormond, who had succeeded to the title only collaterally, was exposed to the tyranny of James I., and imprisoned for several years; and he resided for a considerable time in the household of the monarch in behalf of one of his Scottish favourites, Sir John Preston, created lord Dingwall, to whom the king had compelled the late earl to marry his daughter, and was now resolved to convey the family estates. The elevation of J. Earl of Ormond, was that of a niece, daughter of Sir John Preston; and being drowned in crossing the Irish Channel, during his father's life, left without provision a large family, of which James Butler, the future duke, was the eldest son. When Earl Walter died, he was sent to the Tower, and there James, now styled viscount Thurles, was arbitrarily seized in wardship by the crown, but, with some care for his instruction, committed to the tutelage of archbishop Abbot; the only benefit by which the king may have designed to mitigate the effects of his inordinate cruelty. The archbishop is said to have neglected the general education of his charge; but he caused him to be well instructed in the Protestant faith, to which we have the testimony of Burnet, in other respects not his panegyrist, that he staunchly adhered.

On the death of James I., Earl Walter having recovered his own liberty and the guardianship of his heir, then in his sixteenth year, the young Lord Thurles began soon after to take upon himself the control of his own affairs, and to assume the character of a statesman. He was not the less fortunate in reconciling differences which had been fatal to both their families; and, in 1632, Lord Thurles succeeded, on his grandfather's death, to the earldom of Ormond.

It was at this time that Lord Wentworth, more unhappily distinguished under his later title of Strafford, entered on the government of Ireland; and the spirited and honourable deportment of the young earl of Ormond soon attracted so much of his notice as to lead him to prophesy, with much pleasurable satisfaction, that he would make the greatest man of his family. In subsequent years, the upright and generous devotion of Ormond to the service of the crown and country won the respect even of his infallible lord. By the death of Strafford; and after his own ruin, one of his last requests to his royal master, was that the less fortunate in reconciling differences which had been fatal to both their families; and, in 1632, Lord Thurles succeeded, on his grandfather's death, to the earldom of Ormond.

On the breaking out of the Irish Rebellion of 1640, Ormond was appointed by the lords-justices to the command of the royal forces, and throughout the disastrous period which followed, he continued, amidst the fury and jealously of factions, embittered both by political and religious hatred, to pursue with unshaken integrity and moderation a course of true patriotism and fidelity to his country. He took part in the battle of Knockholt, near Dublin, at Drogheda, at Killrush, and at Ross; but notwithstanding these services, in the course of which he was thanked by the Long Parliament, and raised to the dignity of marquis by the king, he was so ill supplied with troops that he was attacked, 1643, and defeated, by his unequal conflict in which he had engaged. There were now no fewer than five parties in Ireland:—the Catholics and Roman Catholics well affected to the king, but opposed to the Protestant interest; Protestants favourable to the parliament; the Papists under the protection of the crown; the Scotch Presbyterians of the north, who had their separate interests and feelings. The exertions of Ormond being paralysed by the divisions and the defects of those factions from against the common enemy, he was compelled, in 1643, to conclude a treaty for a cessation of arms, which, on account
ORM, or more properly HORMUZ, is an island at the entrance of the Persian Gulf, near 27° N. lat., and 56° 30' E. long. It is about ten miles from the Persian coast, and about twelve miles in circumference, and 1500 feet in height. It is a circular island, and its appearance from the sea is broken and rugged. It is a mere barren rock, without vegetation. The surface, which is entirely without soil, exhibits the singular stratification of the island; the conical shape and isolated position of the island, in the windward coast, which consists, lead the spectator to attribute its origin to volcanic agency. The rugged hills which line the eastern shores of the island are covered for a considerable distance from their base, with a growth of vegetation; in some places it is as transparent as ice. In other places the surface is covered with a thin layer of dusky red-coloured earth, which owes its colour to the oxide of iron, with which the whole surface of the island is impregnated. Even the sand on the seashore is impregnated with the finest particles of iron, polished by the waves. As the island contains no fresh-water springs, the inhabitants use the rain-water collected in several tanks, which were constructed perhaps some 300 years ago. There is excellent anchorage on the north-eastern coast, opposite the chief town of the island, which may be sheltered from all winds within half a mile of the shore. The fortress is situated about 300 yards from the shore, on a projecting point of land, which is separated from the island by a moat. The plain which separates it from the hills, and is about two miles wide, are the ruins of the once famous town of Hormuz. The Imam of Muskat has now possession of the island; he farms it from the king of Persia, and has a garrison of 100 men in the fortress. He derives a revenue from the salt, which is exported in large quantities. In 1827, the number of inhabitants was estimated at 300, all of whom were employed in collecting salt or in fishing.

The name of Hormozia occurs in Arrian's 'Indica, where however it does not denote the island, but a town situated oppugned by the continuous current of the river Anamis, now called Minaw. The name was afterwards transferred to the island, which, according to Ouseley, was previously called Jerlin. In antient times it seems only to have served as a place of retreat to the inhabitants of the coast of Persia, when exposed to attack from the Almoravites. Albuquerque took possession of the island in 1507, and of the town, which was then on it, with the view of preventing the Arabs who inhabited the shores of the Gulf from sending regular supply of ivory to the Portuguese. The town was called Almara, with whom they carried on a lucrative commerce. The consequences of this event were much more favourable to the Portuguese than Albuquerque had imagined. The inhabitants of the shores of the Persian Gulf finding that their commerce with Hindustan was entirely cut off, the Portuguese made Hormuz the deposit of all kinds of Indian goods, and managed their affairs so well, that in a short
time Ormus became a populous and rich commercial town. The buildings covered a space three miles in length along the sea-shore, and two miles in width. The town contained 4000 houses and 40,000 inhabitants, and its commercial relation was its great consequence. Persia and Mesopotamia to Bukhara and Samarkand in Turkestan. The loss of Ormus was one of the first signs of the decline of the Portuguese power in India. In 1629, Shah Abbas the Great took it from them, in which enterprise he was assisted by the English with a large number of envoys. The deserted town, after the departure of the Portuguese, demolished the town, and transferred its commerce to Gombroon, or Bunder Abbas, on the mainland of Persia, nearly opposite to Ormus. Gombroon continued to be the principal commercial town on the Gulf of Persia until the middle of the last century, when Abou-shahr took its place.


ORNE, a department in the northern part of France, bounded on the north by the department of Calvados, on the north-east by that of Eure, on the east and south-east by that of Eure et Loir, on the south by those of Sarthe and Mayenne, and on the west by that of Manche. The department has an irregulus oblong figure; the greatest dimension is from west to east, from the bastion de Longny to that of Passais near Domfront, 94 miles; the greatest breadth from north to south is from near La Ferté Frenel to the contact of the three departments of Orne, Sarthe, and Eure et Loir, 50 miles. It is comprehended between the parallels of 47° 15' and 48° 32' of latitude, and between 1° and 5° 11' of longitude. The area of the department is estimated at 2364 square miles, being very little less than the average area of the French departments, and rather exceeding the conjoint areas of the English counties of Kent and Sussex. The population of the department in 1836 it 443,688, showing an increase in five years of 1807, or less than half per cent, and giving 183 or 184 inhabitants to a square mile. In amount of population it is inferior to either of the departments of Upper Loire or Eure et Loir, and in density to population very far below them. Alençon, the capital, is 105 miles in a direct line west-south-west of Paris, or 115 miles by the road through Versailles, Dreux, and Mortagne.

The department is traversed in the direction of its length by the mountains which form the prolongation of the Armorican chain, and which separate the basin of the Loire from the basins of the Seine and the various small rivers that flow into the English Channel. The western side of the department is broken by the chasm of the Sée, which underlies the coal-measures. Coal is not found, at least not worked. The valleys of the Sarthe and Orne are chiefly occupied by the formations which intervene between the chalk and the new sandstone; and the eastern side of the Hil de Raine is the Charonnais, and which encircles the Paris basin. Mines of iron and manganese are worked in several places: gold was once found, but the working of the mine has been long given up. Granite of a fine grain, limestone, freestone, white and grey marl, kaolin for porcelain, clay and clay for earthenware, and of various kinds suited for glass-works, and the crystals of quartz known as the Alençon diamonds, are dug. There are several medicinal springs, the most important of which are those of Bagnoles near Juvigny, and those near Domfront. There are glass-works in the department, in which are made furnaces for smelting pig-iron, and thirty forges for producing wrought-iron. Charcoal is almost exclusively employed as fuel in these works.

The rivers are some notable in the department. The Mayenne has its source and some part of its course just within the southern border; and the Vés, the Varenne (with its feeder the Égrène), and the Sarthe, tributaries of the Mayenne, also rise in the department, in or upon the border of the Sarthe has the first 35 miles of its course. The Huines, a tributary of the Sarthe, and the Commeauche and the Mene, feeders of the Huinie, rise in this department, and water its eastern part. The Mayenne and its tributaries belong to the system of the Loire. The Eure, the Orne, the Dive, and the Touques, with their feeders the Vé, rise in the department. The Orne, the Dive, and the Touques flow into the English Channel. There are no navigable canals, and the department is entirely destitute of internal navigation.

There are eight Routes Napoléon, or important roads, having an aggregate length of 294 miles, viz. 85 in good repair, 113 out of repair, and 6 unfinished. The principal road is that from Paris to Rennes and Brest, which enters the department on the east side, and passes through Touques and Le Mêle. It has now been completed beyond which it quits the department. Roads lead from Alençon in one direction to Le Mans, in the department of Sarthe; in another, by Sées and Gacé to Rouen, in the department of Seine Inférieure, with a branch from at Nées by Argentan to Falaise and Calais, in the department of Calvados. A road from Caen to Mayenne and Lavall (Mayenne) passes through Flers and Domfront, in the western side of the department; and a road from Paris to Alençon passes through Magny, Le Lude, and Mortagne, and which is paved through Bellême in the south-eastern corner. The Routes Départementales, or departmental roads, have an aggregate length of 294 miles, viz. 183 in repair, 6 out of repair, and 105 unfinished. The by-roads and paths have an aggregate length of 31,500 miles.

The climate is temperate: westerly winds are predominant, and bring with them mists and rain. Agriculture is in a backward condition, the cultivators clinging to old usages with considerable tenacity. The whole surface of the department is divided into upland and lowland, of which about 800,000 acres, or above half, are under the plough. The principal grain cultivated is oats, the produce of which exceeds the average produce of France in the proportion of 4 to 1. In wheat and barley the produce is more than the average of France, and in the corn, considerably below, and in potatoes still more so; but in buckwheat the preponderance is proportionately almost as great as in oats. About 25,000 acres are occupied as orchards and gardens: the growth of apples is considerable, but, though perhaps not equal to what it was before the Revolution. As no wine is grown, cider is the common drink, and in abundant years a portion of it is distilled into brandy. Pulse, hemp, and flax are raised; plums are grown in considerable quantities, and the same is the case with the manufacture of sugar. There are about 300,000 acres of meadow land, and heaths and open pasture-grounds to the extent of 45,000 acres. The meadows, especially in the valleys of the Touques and the Vé, produce abundance of hay and hay grass; and the hay and hay grass, and other produce, are the number of which this department is pre-eminent. The horses are of the best Norman breed, and the horned cattle are generally of good breed. The butter and cheese, except the cheese of Vimoutiers, which is in good repute, are of inferior quality. The oxen for fattening are brought from the departments of La Vendée, Deux Sèvres, and Mayenne: the finest beasts are sent to Poissy (Seine et Oise) for the supply of Paris. The number of sheep rather exceeds the average of France, but the breed and management have been very much neglected; feeding them is little practised. The introduction of the Merinos and the crossing of the breed with them have led to some improvements. Swine are numerous, and are almost entirely destined for the supply of Paris. In the arrobinions are great quantities of geese, and those which have been fattened for the market. The flesh and their quills and feathers form important articles of produce. Bees are kept. There are about 180,000 acres of woodland. Small game is tolerably abundant; the partridge and woodcock are in high repute. The rivers abound with fish.

The department is divided into four arrondissements as follows:

<table>
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<tr>
<th>Arrondissement</th>
<th>Population</th>
<th>Communes</th>
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</thead>
<tbody>
<tr>
<td>Alençon</td>
<td>64,000</td>
<td>106,000</td>
</tr>
<tr>
<td>Argentan</td>
<td>72,000</td>
<td>133,000</td>
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<tr>
<td>Domfront</td>
<td>82,000</td>
<td>126,000</td>
</tr>
<tr>
<td>Mortagne</td>
<td>75,000</td>
<td>125,000</td>
</tr>
</tbody>
</table>

2364 441,681 443,688 554
There are thirty-six cantons or districts, each under a justice of the peace.

The arrondissement of Alençon contains the towns of Alençon (population, in 1831, 13,448 for the town itself, or 14,919 for the whole commune); in 1856, 13,934 for the commune [Alençon] and Le Môle, on the Sarthe; Sées (population 3675 for the town, 5049 for the whole commune), on the Orne; Carrouges, on the Udon, a feeder of the Orne; and Essey, between Le Môle and Sées. Sées, probably a capital of the Sai, an ancient Celtic people, was of more importance in the 5th century, adorned with sculptures and paintings. The townsmen are engaged in the manufacture of embroidered muslin and other cotton goods. There is a college and an agricultural society. Charlotte Corday was born at Sées. Le Môle is a small town on the great road from Paris to Alençon and Rennes. The inhabitants amount to about 1500. At Carrouges the manufacture of an embroidered muslin is carried on.

In the arrondissement of Argentan are—Argentan (population, in 1831, 3170, 5267 for the commune in 1836, 5772 for the commune) [Argentan]; and Écouche, on the Orne; Grand Montre, on the Thonnue, a feeder of the Orne; Briouze, near the Rouvre, another feeder of the Orne; Ranos, between the Thonnue and the Rouvre. The inhabitants, 10,820 in 1836, are Vimeoutiers, on the Via; Merlierault, Gacé, and Le Sap, on or near the Touques; and Echauffou, St. Evroult, and La Ferté Frenel, on or near the Charentonne. Vimeoutiers is the centre of a district in which 26,000 persons are engaged in the manufacture of the thin sort of linens. This is several tanyards in the town, which has a population of about 3700. The village of Sainte Honorine de Guillaume, west of Argentan, has a population of 2000, who are engaged in quarrying and working granite; and at Le Pin, near Argentan, there are several manufactories of flax. Before the Revolution, this establishment was maintained in great extent and completeness, and persons resorted to it from all parts of France, and from England. The manufacture of flax in the manufacturing towns is in a state of great decay. There are many people hunting and feeding horses at the expense of the inhabitants. The Revolution suppressed the flax manufacture, but it has been re-established during the consular government.

In the arrondissement of Domfront are—Domfront (population, in 1831, 1511 for the town, or 1873 for the whole commune); in 1836, 2417 for the commune) and St. Gervais, on the Varenne; Zonlay, on the Egrame; Flers (population 1846 town, 4368 whole commune), on a branch of the Varenne; St. Martin-le-Beau (population 3223 town, 3413 whole commune), on the Noree; La Corneille, near the Rouvre; Courtenay and Juvinay-sous-Andaine, on or near the Mayenne, and La Ferté Macon (population 2122 town, 4613 whole commune), on a branch of the same river. Domfront and Flers are famous for their wool and harness. The townsmen are engaged in the manufacture of knit and the weaving of woolen fabrics. At Flers and La Ferté Macon, cotton goods are woven, and at the latter box-wood snuff-boxes are made. The manufacture of flax has some historical interest as the scene of the battle which transferred the duchy of Normandy from Robert, eldest son of William the Conqueror, to his younger brother and successor, Robert the Magnificent.

In the arrondissement of Mortagne are—Mortagne (population, in 1831, 4748 town, 5158 whole commune; in 1836, 5693 commune), near the head of the Commequache; Tourovure, near the bank of the same river, and Longoy on the Acou, a feeder of the Aunette; and Villeneuve-sur-Heudeville, on the Heudeville; Bellême (population 3264 town, 3413 whole commune), on the Môme, a feeder of the Heudeville; Moulins-la-Marche, near the head of the Sarthe; and La Borie (population 4712 town, 5412 whole commune), on the Rille. Mortagne is on the summit and the eastern slope of a hill, the height of which has been estimated (but probably with exaggeration) at 1000 feet. It is walled, and entered by five gates, adjacent to which are many suburbs. The principal street is of considerable length and of a good width; it runs along the road from Paris to Brest, and near its western end is the parade, the principal open space in the town. Mortagne is the residence of many genteel families, and abound with mansions and good houses, which, together with the length and width of its principal street, lead travellers to think of a greater extent and importance than is really the case. The numerous shops are well furnished, and with articles of luxury or convenience not commonly kept in towns of the same size; with these articles it supplies places larger than itself. The great want of the town is water. It is supplied from fountains at the foot of the hill, from which the town is called Fontenay-le-Grand. The inhabitants. The principal church is in a commanding situation: it is of Gothic architecture, and its massive tower, surmounted with a 'quadrangular dome,' forms a striking feature at a distance. The church is a fine building, with a pleasant garden attached; but has not (until lately established) either a theatre or public walk. There are some linen and cotton manufacturers; the linens are suited for exportation to the colonies. There are two weekly markets; and several yearly fairs, one of considerable horse-fairs. Mortagne was antiently the capital of the province of Le Perche, and a place of strength: it suffered much in several wars, and in the war of the League was pillaged by one party or the other twenty-two times. There is a Trappist convent, re-established with additional auxiliaries since the restoration of the Bourbons. At Tourovure, which has about 1500 to 2000 inhabitants, are iron and glass works; at Longny, which has about 2500 to 3000 inhabitants, there are iron works, a foundry, iron smelter, and a manufactory of iron in castell and horses. Rémârdal or Regmardal, with about 1700 inhabitants, is pleasantly situated, and is the seat of a small trade in hemp and hides. Belleîme is a hill; it consists of one principal street along the road from Chailles and Nogent to Mortagne. It was fortified in 1673, and the town was surrounded and sustained several sieges. The inhabitants manufacture some table and other linens, cotton goods, and paper; and trade in agricultural produce, and in wood obtained from the forest of Belleîme, one of the best in France, which extends from the San to the Vire. The manufacture of knitting and sewing needles made here are known all over France; and a great quantity of curtain-rings, iron, steel, and copper wire, wires for pianos, and other small hardwares are made. Stockings, hats, laces, tapes, woolen and linen fabrics, and paper are also manufactured. There are five yearly fairs.

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ornithichnites, Professor Hitchcock's name for the footmarks of birds impressed on the surface of sandstones in the valley of the Connecticut. [Grallatortes, vol. xi., p. 343.] The following will be read with interest as being connected with paper read before the Geological Society of London on the 15th May, 1835. Dr. Mantell stated that soon after his attention was directed to the fossils of the Wealden, he discovered in the strata of Titchfield Forest several slender bones, which, from their close resemblance to the tarsal and metatarsal bones of certain Grallator, or waders, he was induced to refer to Birds. The correctness of this opinion was afterwards doubted, in consequence of the so-called bones of birds found at Stonesfield being ascertained to be the remains of Pterodactylus; nevertheless, however Dr. Mantell discovered specimens of a more decided character, and submitted them to Baron Cuvier during his last visit to England; and that distinguished zoologist pronounced them to have belonged to a bird, probably a species of Grallator. Dr. Mantell, however, still entertained, not only whether these remains did really belong to any of the Ardeaes, but whether they were referrible to Birds at all: the specimens having been placed by Dr. Mantell to the Protothorax of the pterodactylus, the saurian anatomist pointed out one bone as having undoubtedly belonged to a Wader. This fossil he declared to be the distal extremity of a left tarsometatarsal bone, and it presented the articular surface, or place of attachment, of the tibia to the bone for ornamentation. The bones were conceived by the professor to have belonged to a more erpetoid form of bird than is now known.

This examination confirms Dr. Mantell's previous views of the existence of the remains of Birds now in the chalk, and the fossils described by him are the oldest remains of the class at present discovered. (Geol. Proc., vol. ii.; Geol. Trans., vol. v., 2nd series.)

ORNITHOCERIUS. Sommering's name for the extant Saurian form termed Pterodactylos by Cuvier. [Pterodactyle].

ORNITHOLOGY, the science which teaches the natural history and arrangement of birds. The term is derived from the Greek words "Ornis," a bird, and "Légein," to discuss; signifying literally, a discourse upon birds. [Birds.]

ORNITHOPUS, is a genus of small papilionaceous annual plants, found in pastures and wild places in Europe. They are characterised, among other things, by a cluster of curved pods which are jointed something like a bird's toe, on which account they are called bird's-foot trefoil. The species found in this country is a plant from two to six inches high, with pinnated leaves and small white flowers striped with red, and is of no economical importance; but in Portugal occurs the O. sativa, an annual growing as much as two or three feet high, with stems as succulent and nutritious as those of vetches or lucerne, and cultivated in that country as food for cattle under the name of Serada. It is very much the same thing as the Giliee of the English, bearing an abundant produce in the poorest soils. The writer of this note formerly saw it grown to some extent in the sandy lands about Thetford, and the crop of herbage at that time was most abundant; it does not however seem to have been cultivated as a general cultiva in England.

ORNITHORHYNCHUS. Blumenbach's name for that extraordinary quadrupedal form, The Duckbill, or Duckbilled Platypus, Platypus anatinus of Shaw; Mammalia, Tammcret, and (according to the French) Mouflonage of the naturalists of New South Wales; Water-mole of the English. (Letters of Sir Joseph Banks to naturalists.)

It is hardly to be wondered at that when this animal was first sent from New Holland to this country, it was received by zoologists with caution amounting to suspicion. The singular beak, which occupied the usual place of the mouth, startled the observer when it appeared as the organ of a hairy quadruped; nor was it till one or two more specimens arrived (from Governor Hunter, we believe, and addressed to Sir Joseph Banks) that naturalists were ready to allow that this beak was naturally attached to the body.

Upon a form so anomalous conjecture was busy, more especially as to that part of its distribution relating to its production. Was it oviparous or viviparous? Did it sucke its young? These were questions constantly asked, and answered as such questions generally will be, in the absence of autopsy and direct experiment, by such considerable tales and bungling accounts of the different theories, with no satisfactory result. Evidence however gradually came in, and fortunately fell into the hands of those capable of using it; and we now know, principally by the enlightened labours of Sir Joseph Banks, that this singular animal is an ovoviviparous, animal, that suckles its young, and that its proper place is among the Monotremata, or Monotremes, a group to which no animal hitherto discovered belongs, excepting that which forms the subject of this article and Echidna. [Echidna; Monotremes.]

Both these forms appear to have been first presented to the public by Dr. Shaw:—Echidna under the appellation of Myrmecophaga oculeata; and the Duck-billed animal under the name of Platypus anatinus. This was at the time of the publication of the Quadripartite of the present, Blumenbach described the latter form more at large under the title of Ornithorhynchus; and Mr. Home (afterwards Sir Everard) gave an account of some anatomical peculiarities connected with the head and beak, in Proc. Zool. Soc. of the English Sir Everard. On the anatomy of Echidna and Ornithorhynchus (Phil. Trans., 1802) went more at large into the subject, and disclosed numerous affinities between two forms differing much in external appearance. This gave a strong ground for the belief that the Monotremata, a group to which both belong, might have been derived from the same generic name; and at the same time expressed his opinion that the generative process differed considerably from that of the true Mammalia, resting that opinion on the peculiarities of the organs destined for reproduction, basing his theory on the fact that these organs, in both species, especially in the female Ornithorhynchus, Geooffry St. Hilaire was not tardy in adopting the opinion of Sir Everard. He constituted a new order for these strange forms, and a hasty dissertation having led him to conclude that the genital organs of both sexes, as well as the urine and feces, had their issue by a common outlet, he gave to that order the name of Monotremes. His inferences were, that both mammary glands and nipples were wanting; and certain accounts of the discovery of eggs by the Ornithorhynchus, strengthened the ovoviviparous character of the Monotremes, he separated that order from the Mammalia.

A penetrating mind like Cuvier's could hardly fail of being attracted by this extraordinary subject. Meckel, and the great and acute French zoologist from the true Anti-eaters (among which its first describers, deceived by external appearances, had placed it), and separated under the name of Echidna, by which it is still known. Following out the anatomy of that form as well as of Ornithorhynchus, he saw their mutual relations, and adopted Geooffry's group and name, but did not exclude the tribe or family from the Mammalia.

The opinions of Geooffry were strenuously opposed by Oken and De Blainville. The former even conjectured that the mammary glands would be found in the cloaca. The latter, in a learned dissertation upon the place which Echidna and Ornithorhynchus ought to occupy in the system, expressed his opinion that these peculiarities of the female would be ultimately detected, and his opinion that the animals themselves approached closely to the Marsupalia. We now arrive at a period when the thick darkness which obscured this interesting subject began to be dispelled by the light derived from a further supply of subsequent and consequent anatomical investigation. Professor Meckel (1824, 1826) determined the existence of the mammary glands, and showed, particularly in the work of the late Dr. Jackson, published on the 'Monotremata,' that they were largely developed in the female. Their situation, size, form, and lobular composition are accurately described. He was not able to inject the gland, and did

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not accurately know the exact termination of the ducts, but he noticed certain small eminences in the middle of the areolae, and announced that they were without doubt the orifices of those ducts. So far Meckel satisfactorily proved this, which may be the case in _Ornithorhynchus_ and in the Marsupialia in general, but his reasoning led him to conclusions unfavourable to the identity of their mode of reproduction. He argued that the difference between the production of living young and of eggs is in reality very small and easy to explain; that commonly hatched eggs within the body, and, in effect, given birth to a living chick; concluding that as the generation of the Marsupialia closely resembles the oviparous mode, it is highly probable that the method of generation of the _Ornithorhynchus_ approaches still nearer to birds and reptiles, might be analogous in proportion.

The clear and authentic demonstrations of Meckel were not sufficient however to dispel the doubts which still hung over the subject in the minds of some. It is hard to some natures give up preconceived opinions, and M. Geoffroy St. Hilaire, who had subsequently dissected a female _Ornithorhynchus_, stoutly combated* the evidences adduced by Meckel of the mammiferous nature of the animal, and began to form to himself an opinion, of the latter, in his attempt to invalidate them. He denied that the subcutaneous glands pointed out by Meckel were mammary, urging that they had none of the characters of a true mammary gland—that he had compared them with the glands in the subject in Ortholestes and in the Marsupialia and that their texture was totally different—that they consisted of a multitude of sacsums placed side by side, and all directed to the same point of the skin, where were to be seen only two excretory orifices, and those so small that the best that could be done in his 1834 publication was to say there was no trace of nipples. He further stated that in the individual examined by him, which had the appearance and proportions of an adult female, the gland was not more than one-fourth as large as in Meckel's specimens, which negatived the supposition of a mammary gland being fully developed, an enlargement of all its constituent parts is effected, and the nipple acquires additional size even before the commencement of lactation, and remarking that no such appearance has been noticed in _Ornithorhynchus_.

Having thus denied the inferences of Professor Meckel, he accounted for the use of these glands, and he considered them as analogous to the glands upon the flanks of aquatic reptiles and fishes destined to secrete a lubricating fluid, or to the odoriferous follicles in the peculiarly hairy quadrupeds, especially those on the sides of the abdomen in the Repros. To these strictures Professor Meckel replied, and was supported by Professor von Baer.

We are now arrive at the interesting papers of Professor Owen, in the cartilages of the humerus subject to the same treatment in the mammillaries. He has settled this much disputed question. The first of these, 'On the mammillary glands of the _Ornithorhynchus paradoxus_,' was read before the Royal Society (21st June, 1822), and is published in _Phil. Trans._ for 1832, part ii.; the second, 'On the mammillary glands of the _Ornithorhynchus paradoxus_,' was read before the same Society on the 19th June, 1834, and is published in _Phil. Trans._ for 1834, part ii.; and the third, 'On the young of the _Ornithorhynchus paradoxus_,' was communicated to the Zoological Society of London, on 27th May, 1834, and is published in the first volume of the 'Transactions' of that Society.

We say no more of these excellent memoirs here, as we shall presently have occasion largely to draw upon them.

**Organization.**

The dental formula of _Ornithorhynchus_ may thus be noted:—molars, 2;2; 3;3; =8.

It is to be borne in mind that these organs are not true teeth; their structure will be explained under the section which treats of the digestive organs; but as they perform, as far as their formation will allow, the offices of teeth, and are placed in the situation usually allotted to the molar teeth in Mammals, the expression 'dental formula' is not inappropriate.

**Skeleton.** The cranium, though widely differing from that of other mammals, approaches more closely to the annular type of that class, as Cuvier observes, than to any other. It is rounded or oval; it is wide and high, and without...
by a clinoid and very elevated lamina. The most curious internal part is the ethmoidal fossa, which is small and has only a single hole of no great size for the olfactory nerve, and perhaps another very small one; on each side are spaces, purely membranous, to separate it from the canal of the suborbital nerve. The three semicircular canals project far inwards and intercept a very remarkable hollow. It may be seen in any character in which the skull of the Ornithorhynchus approaches those of birds. The bony tentorium is scarcely perceptible, but there is and this is very remarkable—a large longitudinal osseous fulcrum.

In the museum of the Royal College of Surgeons (Physiological Series, No. 1546, A) is a longitudinal section of the head, showing the bony septum narium, and some filaments of the olfactory nerve descending upon it; also the external nostril, the long nasal passage, with its anterior communication with the mouth by the foramen incisivum, and its posterior aperture beneath the basis crani. In the cavity of the cranium may be observed the bony fulcrum. (Cat., vol. iii., part i.)

The bones of the arm and forearm, &c. have nothing so remarkable about them as to require particular description, especially as their conformation and relative position will be seen below; but it is deserving of notice that the coracoid process of the scapula is very broad and flat. The sternum is the same as in the other mammals, two for the thumb and three for the fingers.

**Anterior Extremities.**—In both of the Monotremes the most remarkable part of their osteology is perhaps the shoulder, which answers to that of Birds, and still more to that of certain Lizards. The external surface of the scapula is concave, so that it is far from adapting itself to the ribs. Its form and relative position will be better explained by the cuts than by words. The whole of what may be termed the sternal apparatus appears to be formed more as the model of the Saurians than after that of the Mammals: indeed it very much resembles that of the Ichthyosaurus (Ichthyosaurus, vol. xii., p. 431), and, like it, is admirably adapted for an animal destined to collect its food at the bottom of lakes and rivers, and requiring machinery to enable it to rise continually to the surface for a supply of air.

The femur of the latter has projecting crest, as in Echidna; in both animals it is short, wide, and very much flattened. The crest of the rib is not strongly marked; that of the Ornithorhynchus is arched or bent, and the animal ordinarily turns its leg like the seals (Phoca) and lizards, so that the nails are directed backwards, the ribs and the great toe being towards the outside, the fibula and the little finger towards the inside. The fibula is nearly straight, very distinct, and tolerably strong, and has on the outside of its upper extremity a large compressed apophysis which is elevated considerably above the head of the bone, offering an extensive surface for the insertion of the muscles. Here may be traced some analogy to the Carpus in the Marsupialia, which also have the fibula very wide above and furnished with a supernumerary bone, which is elevated above the head of the fibula. In the tarso the analogy is more to the mammals than the reptiles. In the Echidna there is an astragalus, as in a true reptile, a scaphoid bone, a cuboid bone, three cubeiform and two supernumerary bones; in the Ornithorhynchus there is one more, the cuboid bone being separated into two. The oss calcis of the latter presents a short and blunt tuberosity, and its form is nearly square. The number of the bones of the fore feet is thus: in the mammals, and the claws are more curved than those of the fore feet.

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*Sternum apparatus of Ornithorhynchus two-thirds of the natural size.*

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to those of the Lizards, the rest of that portion of the skull is exhibits a conformation analogous to that of quadrupeds. The composition of the sternum is effected by successive pieces, and not by a cartilaginous dilatation as in the Saurops, or a disk composed originally of five pieces as in Birds.

There are four of these pieces without reckoning either the Y-shaped bone or the xiphoid cartilage, which in the Ornithorhynchus is ossified and forms a fifth, making six in all. The piece which immediately follows the Y-shaped bone is larger than the others, and in the Ornithorhynchus exhibits traces of longitudinal division. The sternal portion of the ribs is ossified as well as the others, as in Birds, and is joined to the sternum by a cartilaginous portion, but there is no recurrent apophysis to the dorsal ribs as in Birds. The sternal portion of the fifth and sixth ribs is very much dilated in the Echidna, and it is also very much dilated in the Ornithorhynchus; these dilatations extend as far as the eighth in the Ornithorhynchus, and become imbricated or laid over each other like tiles. In both genera the three last false ribs have only very small stumps, and in Ecchidna, there are two more false ribs, but only two lumbar vertebrae, whilst in Echidna has three. Bot genera have seven cervical vertebrae, like the rest of the Mammals. In Ecchidna they are all flat below, but have a sort of median obturator in the Ornithorhynchus, and in the latter, even in the adult state, may be still discerned the sutures which unite the transverse apophyses to the body of the vertebra; here again an analogy to the Reptiles. The four first dorsal vertebrae in the latter, and the three in the Ornithorhynchus, and which are wanting in Ecchidna; and in the caudal vertebraa still greater difference exists; Ecchidna has only twelve, rapidly diminishing conically, whilst Ornithorhynchus has twenty at least, with large and dilated transverse apophyses, forming a depressed tail which reminds one of that of the beaver. The spinous processes throughout have but little elevation, especially in Ornithorhynchus. The vertebrae, with the exception of those of the neck, do not retain the sutures which join their parts longer than those of other Mammals.

**Bone of the Tongue.**—It might have been expected that some traces of reptile organisation would be found in the **Echidna**, but that bone is constructed after the mammalian type, indicated in a single bone, between the coronoid process and the plectent membrane of the jaw, is a horn-like substance in the form of a molar tooth; that on the right side has been removed to show the vascular substance on which it is based, the elevations of which correspond to the cusps at page 79. In the same museum, and series, No. 541, A, is the stomach, in which the cardiac and pyloric orifices are closely approximated, as in the stomachs of birds. The greater part of the cavity extends beyond these orifices, and increases as it descends toward the caudal extremity; the two layers of muscular fibres run in opposite directions, and are thickest along the curvature of the pylorus. No. 753, A, exhibits the cloaca. In this preparation the rectum is laid open posteriorly, to show its termination at the fundus of the outer or common cavity, just behind the orifice of the genito-urinary cavity; and two patches of glands are to be seen, one on either side of the female orifice. The genito-urinary cavity is laid open anteriorly, showing the orifice of the urinary bladder at its fundus, and those of the ureters and oviducts at its sides. White bristles are placed in the former, black ones in the latter, which are nearer the urinary bladder than the orifices of the ureters are. (Cat., vol. i.)

**Generative System.**—We must now recall the attention of our readers to the mammary glands, as connected with this part of the organization of the Ornithorhynchus. In five apparently adult and full-grown Ornithorhynchus examined by Professor Owen, these glands presented as many different degrees of development. In one of the specimens they were reduced to about 1 1/2 inches, in others they were reduced in length respectively 5 inches, breadth 2, and in thickness half a line. In another specimen they did not exceed 14 inch in length, and were only five lines in breadth and half a line in thickness. The other individuals exhibited mammary glands of sizes intermediate between these two. The number of lobes composing each gland amounted from 150 to 200; they were elongated, subcylindrical, disposed in an oblong flattened mass, and converged to a small oval areola situated in the abdominal integument between three and four inches anterior to the cloaca, and about an inch from the mesial line. The lobes in the smaller glands presented the same breadth to near the points of insertion, but in the larger ones they were broadest at the free extremity, measuring three or four lines across, and becoming narrower to about one-third from the point of insertion, where they ended in slender ducts. The lobes were almost all situated to the outer side of the areola, and consequently converged towards the mesial line of the body. The *caputculus cornuorum* was inserted between the glands and the integument, closely adhering to the latter, but connected with the glands by loose cellular membrane. This muscle was here nearly a line in thickness; its fibres were longitudinal, and, separating, left an elliptical space for the passage of the ducts of the gland to the areola.

**Skeletan of Ornithorhynchus. a, the suprascapular bones.**

**Digestive System.**—In the museum of the Royal College of Surgeons in London (Physiological Series, No. 323, B) will be found the lower mandible and jaw, with the tongue, lanclid, &c., of Ornithorhynchus. Here from each side, between the coronoid process and the plectent membrane of the jaw, is a horn-like substance in the form of a molar tooth; that on the right side has been removed to show the vascular substance on which it is based, the elevations of which correspond to the cusps at page 79. In the same museum, and series, No. 541, A, is the stomach, in which the cardiac and pyloric orifices are closely approximated, as in the stomachs of birds. The greater part of the cavity extends beyond these orifices, and increases as it descends toward the caudal extremity; the two layers of muscular fibres run in opposite directions, and are thickest along the curvature of the pylorus. No. 753, A, exhibits the cloaca. In this preparation the rectum is laid open posteriorly, to show its termination at the fundus of the outer or common cavity, just behind the orifice of the genito-urinary cavity; and two patches of glands are to be seen, one on either side of the female orifice. The genito-urinary cavity is laid open anteriorly, showing the orifice of the urinary bladder at its fundus, and those of the ureters and oviducts at its sides. White bristles are placed in the former, black ones in the latter, which are nearer the urinary bladder than the orifices of the ureters are. (Cat., vol. i.)

**Generative System.**—We must now recall the attention of our readers to the mammary glands, as connected with this part of the organization of the Ornithorhynchus. In five apparently adult and full-grown Ornithorhynchus examined by Professor Owen, these glands presented as many different degrees of development. In one of the specimens they were reduced to about 1 1/2 inches, in others they were reduced in length respectively 5 inches, breadth 2, and in thickness half a line. In another specimen they did not exceed 14 inch in length, and were only five lines in breadth and half a line in thickness. The other individuals exhibited mammary glands of sizes intermediate between these two. The number of lobes composing each gland amounted from 150 to 200; they were elongated, subcylindrical, disposed in an oblong flattened mass, and converged to a small oval areola situated in the abdominal integument between three and four inches anterior to the cloaca, and about an inch from the mesial line. The lobes in the smaller glands presented the same breadth to near the points of insertion, but in the larger ones they were broadest at the free extremity, measuring three or four lines across, and becoming narrower to about one-third from the point of insertion, where they ended in slender ducts. The lobes were almost all situated to the outer side of the areola, and consequently converged towards the mesial line of the body. The *caputculus cornuorum* was inserted between the glands and the integument, closely adhering to the latter, but connected with the glands by loose cellular membrane. This muscle was here nearly a line in thickness; its fibres were longitudinal, and, separating, left an elliptical space for the passage of the ducts of the gland to the areola.

**Portion of the integument from the abdomen of Ornithorhynchus pandorus, with the hairs removed so as to exhibit the mammary areola.** (Owen, Phil. Trans.)

Professor Owen further observes, that the areola (when the hair which covers it has been removed) can only be distinguished on the external surface of the skin by the larger size of the orifices of the ducts as compared with those for the transmission of the hairs, and, occasionally, by being of a deeper colour than the surrounding integument. The orifices of the ducts thus grouped form an oval spot, which in the specimen with the largest glands measured five lines in length and three in the short diameter. In that with the smallest glands the areola was traced with a lens to nearly the same extent in the long diameter, but it was much narrower. From the minuteness of the orifices of the ducts in the specimens with the small glands, the situation of the areola could hardly be detected without previously dissecting the gland; whilst in those in which the glands are fully developed, the areola is easily discovered or the removal of the hair by a practised eye. In none of the specimens examined by Mr. Owen was the surface on which the ducts terminated at all raised above the level of the surrounding integument; and he conceives that the elevation like a millet-seed in Meckel's specimen was accidental, and not essential to the structure of the part, Mr. Owen having observed similar rising of the integument at different places in the areola, and not in the areola itself. The orifices moreover appeared of nearly equal sizes, not any of them being calculated to suggest the idea of its being common to many ducts or lobules, as might be inferred from M. Geoffroy's description.
The female organs are well displayed in the following preparations preserved in the museum of the Royal College of Surgeons. No. 2734, A (Physiological Series) exhibits the female organs and clauca of an Ornithorhynchus in an unexcised state. The left ovary, an irregular, oval-shaped, flattened body, has a wrinkled and slightly granulated surface; it is attached to one angle of the wide aperture of the oviduct; the margins of the aperture are extremely thin, and are without any papillae or para. The convoluted portions of the oviducts, and the comparatively straight course of the uteri as they pass along the connecting duplicatures of the peritoneum, are seen on both sides. The whole extent of the clauca is laid open, showing the projecting thickened margins of the uterine organs. But it is not between which is the outlet of the urinary bladder, where a bristle is inserted. Just below the junction of the rectum with the urethral-sexual canal are the orifices of the anal follicles, in two lateral groups. No. 2734, B, of the same series, are the female organs and clauca in a state ready for impregnation. The left ovarium is crowded with numerous ovicases in various stages of development; two of which are conspicuously larger than the rest, and project in a greater part of their circumference from the surface of the oviduct, and are attached to the corresponding ovicases of the right ovarium. The clauca is laid open, and the oviduct has been removed to show its relation to the ovicases, and one of its extremities with that of the oviduct at the highest point in the preparation. The dilated commencement of the oviduct, or Fallopian tube, with its wide and simple slit-shaped aperture, are left entire. They are adapted to receive the ovicases or follicles when conveyed by the oval-shaped ovicases of the ovary. The contracted part of the oviduct is laid open, showing the irregularly wrinkled or flocculent character of its lining membrane. The right ovarium and ovarian ligament are extended in the preparation transversely below the left. The ovary, which presents a characteristic appearance of the follicular enlargement, contains, nevertheless, many perfect ovicases and germinal vesicles, which might, possibly, be developed so as to be susceptible of impregnation. The right uterine, which is shorter than the left, presents a similar structure. Both uterine and ovarian cavities are developed: they are lined by a thick membrane disposed in very minute oblique wrinkles, and its different colour, due to its greater vascularity as compared with that of the oviduct, is still perceptible. The many vascular tubules extend throughout the cervix, and continue to increase in thickness to the uterine, which projects, like the ovicase in ordinary Mammalia, and also, like the oviduct in the turtle (Cheloma Mydas), into the commencement of the urethral-sexual canal, and near the apex of the vagina, and of the virginal or hymen. Above and between the ovicases appears the orifice of the urinary bladder; below them are the outlets of the ureters, in which bristles are inserted. The arrangement of those orifices corresponds exactly with that in Chelona. The lining membrane of the urethral-sexual canal is disposed in irregular longitudinal ripples, which slightly converge to the place of its junction with the rectum, which is seen at the back of the preparation. The common external passage of the clauca is laid open, and the clauca and cervix are completely exposed. The tubules are turned to one side, while the bilobed clauca is exposed at the back part of the preparation, and a bristle is passed through the preputial orifice, which is situated just within the anterior verge of the common external outlet of the clauca. (Catt., vol. iv, p. 575.) The preparation is figured by Professor Owen, in Phil. Trans., 1832, pl. xvi., to which memoir we refer the student for further particulars.

The season of copulation is at the latter end of September or the beginning of the month of October. The precise period of gestation and the condition of the excluded product, strictly speaking, still remains to be determined; but in the first week in December, Mr. G. C. Bennett found in a nest of an Ornithorhynchus three small naked embryos, not quite two inches in length, and which he supposed, with apparently good ground, to have been recently born. The young Ornithorhynchus were not preserved, for want of the necessary means of preservation. But Dr. Hume Weatherhead presented to the Zoological Society of London two young specimens a little further advanced than those found by Mr. Bennett. They were of...
different sizes. The smallest rather exceeded two inches in length, measured from the end of the bill to the end of the tail in a straight line. The largest was double that size, and was one of the two young Ornithorhynchus taken with the mother from a nest on the banks of the Fish River by Lieut. the Honourable Lauderdale Maule, and kept alive for about a fortnight by that gentleman. These specimens were placed in the hands of Professor Owen for examination, and formed the subject of his paper in the first volume of the Transactions of the Zoological Society. Our limits will not permit us to follow the Professor throughout this interesting memoir, to which we refer our readers; but there are some points which must be noticed. The stomach of the larger specimen was found full of coagulated milk. On carefully inspecting the whole contents with a lens, no portion of worms or bread could be detected; which, Mr. Owen observes, solves the doubt entertained by Lieut. Maule as to whether the mother nourished this young one with the food which was given to her for her own support, or with the secretion afterwards discovered to escape from the mammary pores; for the mother having been killed by accident on the fourteenth day after her captivity, it was observed, on skinning her while yet warm, that milk oozed through the fur on the stomach. A portion of the coagulated milk from the stomach of the young one was diluted with water and examined by Professor Owen under a high magnifying power, in comparison with a portion of cow's milk coagulated by spirit and similarly diluted. The ultimate globules of the Ornithorhynchus's milk were distinctly perceptible, detaching themselves from the small coherent masses to form new groups: the corresponding globules of the cow's milk were of larger size. With the milk globules of the Ornithorhynchus minute transparent globules of oil were intermixed. So far the experiment may be considered to have been decisive; but, to prevent the possibility of doubt, Professor Owen took a little mucus, and added a drop of water to it, when it instantly became opaque; and its minutest divisions under the microscope were into transparent angular flakes, entirely different from the regularly formed granules of the milk of the Ornithorhynchus.

The circumstances particularly worthy of attention in these young animals are, the total absence of hair, the soft and flexible condition of the membranes, and the shortness of those parts in proportion to their breadth as compared with the adult, as Mr. Owen pointed out. The tongue, which in the adult is lodged far back in the mouth, advances in the young animal close to the end of the lower mandible, and its breadth is only one-third less in an individual four inches in length than it is in fully grown animals; a disproportionate development which is plainly indicative, as Mr. Owen remarks, of the importance of the organ to the young Ornithorhynchus, both in receiving and swallowing its food.

On the middle line of the upper mandible, and a little anterior to the nostrils, there is a minute fleshy eminence, b, lodged in a slight depression. In the smaller specimen this is surrounded by a discontinuous margin of the epidermis; with which substance therefore, probably from its having been shed, of a thickened or horny consistence, the caruncle had been covered. There is no trace of this structure in the upper mandible of the adult, and Professor Owen regards it as analogous to the facial peculiarities of the horny knob on the upper mandible of the bird. He does not however conceive that this remarkable example of the affinity of Ornithorhynchus to the feathered class is indicative of its having been applied, under the same circumstances, to overcome a resistance of precisely the same character as that for which it is designed in the young bird, since all the known history of the oculus of Ornithorhynchus points strongly to its ooviviparous development. Lieutenant Maule's communication not only showed that the fluid secreted by the abdominal glands is milk, but also that the ova of Ornithorhynchus attain the size of a large musket-ball, and, like the eggs of the ooviviparous reptiles, have a soft outer covering. The supposed portions of egg-shell found by Lieutenant Maule in the nest were probably portions of excrement, coated, as in birds, with the salts of the urine, that secretion and the feces being expelled by the same orifice. The situation of the eyes, c, is indicated in the young by the convergence of a few wrinkles to one point.
but the integument is continuous, and completely sheaths the eyeball. Upon this Professor Owen remarks that the absence of vision in the young animal affords strong evidence of its being confined to the nest, where it receives its nourishment from the dam; and this is, he observes, corroborated by the cartilaginous condition of the eye, by which the external organs of the body: the head and tail are closely approximated on the ventral aspect, requiring force to pull the body into a straight line; and he adds that the relative quantity of integument on the back and belly shows that the position necessary for progressive motion is uninhabitable for growth.

Nervous System and Senses.—The senses of hearing and seeing appear to be sufficiently acute in the adult Ornithorhynchus. Smell and taste must also exist in considerable power. The latter sense is probably the most prominent of the others. The mandibles are probably endowed with an acute sense of touch.

Food, Habits, &c.—Lieut. Maule fed the female which he kept in captivity on worms and bread and milk. Mr. G. Bennett, in his paper 'On the History and Habits of the *Ornithorhynchus paradoxus*,' (Zool. Tracts, vol. i.), gives the following account of one when feeding, which he had secured by a cord fastened to the hind-leg:—"It was exceedingly lively, swam in the centre of the stream, and appeared in excellent health and spirits. The water at one part of the river was very clear, I examined the animal down under the water. On diving, it sank speedily to the bottom, swam there for a short distance, and then rose again to the surface; it ranged the banks, guiding itself in its progress according to the impressions received by the mandibles, which, as the use of these organs very distinctly proved, are the organs of touch. It seemed to feed well; for whenever it inserted its beak into the mud, it evidently procured some food from thence, as, on raising the head, after withdrawing the beak, the mandibles were seen in lateral motion, as usual when the animal masticates. Although several insects were basking and fluttering about the surface of the water, close to it, no attempt was made to capture them, either from its not seeing them, or from its preferring the food that was ready. That part of the day, it made its escape from the burrow in the mud, when seeking its food in the mud and water, are the same as those of a duck when feeding in similar situations. After feeding, it would sometimes on the grassy bank, and at others partly in and partly out of the water, resting on the corolla with the hind feet. After permitting it to swim, feed, and clean itself for an hour, it was replaced, although with great reluctance on its own part, in its box; it did not however, as before, betake itself to repose, but commenced and continued sitting on the sides of the box. The author states that those animals feed on the minute *Tessacea* which may be found about the water-plants and in the estuaries. On examining the cheek-pouches or the stomachs of these animals, he always observed the food to consist of river insects, as well as small shells, which were found comminuted and mingled with mud or gravel, probably to aid digestion. River weeds have also been found in their pouches, and the natives say they feed on them also. In the museum of the Royal College of Surgeons are preserved the débris of insects between the scales of the *Neuocercus*, which were found in the cheek-pouches of an Ornithorhynchus. (*Physiological Series*, No. 541, B.) We owe to Mr. G. Bennett, who has contributed so much to our knowledge of this animal, a description of the burrows of these extraordinary creatures. They were traced up a bank of a river, where, amongst some long grass, the entrance of a burrow was discovered, and the internal construction of it was laid open by the hand. The corolla was seen to be very much longer than the width of the passage continued from it, measuring one foot three inches in depth, and one foot one inch in breadth. As it receded from the entrance, the burrow became narrower, being about the usual breadth of the animal when sitting on the sides of the box. 'At a distance of two feet the corolla continues Mr. Bennett,' for the distance of ten feet four inches, and having just delved down upon it so as to perceive it still continuing its course up the bank, the beak and head of a *Water Mole* were seen protruding for an instant from the upper part of it, and had been drawn from its recesses, and had come down to see what we were about with its habitations. It only remained for an instant; for, as soon as it beheld us, it immediately turned up to take refuge in that part of the burrow which yet remained unexplored.

In turning round however it was seized by the hind leg and dragged out. The animal appeared very much alarmed when it was hauled out of its subterranean dwelling: it discharged its urine (which had rather a strong odour) and its faeces, when first caught, which I attributed to fear, for this is not usual with other living specimens that I have seen since. It uttered no sound, nor did it attempt to bite; and proved to be a full-grown female. When I held the unfortunate *Platyurus* in my hands, its bright little eyes glinted, and the oriflées of the ears were expanded and contracted alternately, as if eager to catch the slightest sound, while its heart palpitated violently with fear and anxiety. * * * This animal uttered, when disturbed from its sleep, a noise something like the growl of a puppy, but perhaps in a softer and more harmonious key. Although quelled for a moment by the sight of the hand, it continued to utter a growling noise during the night. 'But we must return to the burrow, the distance of the entrance of which from the water's edge was five feet. It ran up the bank in a serpentine course, approaching nearer to the surface of the earth towards its termination, at which part the nest, composed of dried grass, and weeds strewed over the floor, is situated; but none had been as yet made in this burrow. The termination of the form shown in the cut, measured one foot in length by six inches in breadth. Mr. R. Bennett found the whole extent of the burrow, from the entrance to the termination, to be twenty feet by actual measurement. He observes that the burrows are situated above the usual river height, but do not appear to be above the extensive floods of the river, which frequently take place during the winter season.

**Burrow of Ornithorhynchus. (Reduced from Bennett, Zool. Tracts.)**

The reader will find information of much interest in Mr. Bennett's paper, particularly with regard to the habits of two full-grown young ones, a male and a female, which he kept for some time. They were taken from the nest, which consisted of river sand and the epidermis of reeds and small dry fibrous roots strewed over the floor of the cavity, which was large enough to contain the mother and her young: these are from two to four in number, but most usually two.

**Description.—** Authors generally describe two species, viz. *Ornithorhynchus rufus*, and *Ornithorhynchus fuscus*; but the probability is that they are but varieties of one species, if indeed the difference may not be merely that of age or sex. The males are rather larger than the females, and Mr. Bennett considers the average length to be from 1 foot 6 inches to 1 foot 8 inches. A male shot in the Yass river, measured, from the extremity of the mandible to the extremity of the tail, 1 foot 7 inches, and a female shot in the same river was 1 foot 7 inches, measured in the same way. The following is an account of the characters of the Otter, the Mole, and the Beaver, covered by a fine long thick hair, beneath which is a finer, short, very soft underfur, like the waterproofing of the Otter. Colour above, light black, varying in shades accordingly; it is seen in a stronger or weaker light; beneath, where the fur and hairs are finer, furring, varying in intensity according to age. Tail flat, broad, and inclining on each side abruptly off at the termination, beyond which the lower hairs project; on its upper surface the hair longer and coarser than elsewhere. In young specimens its under surface, as well as the hind and fore legs near the feet, covered by fine silvery white hair. Below the inner angle of the
sequent opportunities of repeating the experiments with animals not in a wounded state, and the results have been the same.'

Place in the System. — Dr. Shaw referred Ornithorhynchus to the Bruta of Linnaeus, and Professor Blumenbach, less correctly, to the Palmita in his system, placing it between the Otter and the Walrus. Lamarck, Van der Hoeven, and Professor Geoffroy St. Hilaire characterised the Monotremata as a class intermediate between quadrupeds and birds. The basis of the last-mentioned arrangement was the presumed want of mammary glands. Cuvier, as we have seen, more philosophically, admitted the forms into his 'Régne Animal' as a tribe or family of bis order Edentata. M. de Blainville considered the Monotremata as most closely approximated to the Marsupialia. Meckel arranged them among the Mammalia, next to the Edentata. Mr. Gray, in his 'Outline,' placed Echidna and Ornithorhynchus in the 5th subfamily (Ornithorhynchinae) of his 4th family (Dasyuridae). This 5th subfamily being immediately preceded by the Myrmecophaginae. J. B. Fischer, in his 'Synopsis,' arranges the two forms at the end of the Bruta, which are immediately succeeded in his work by the Bellaco. M. Lesson makes the Monotremata the second and last tribe of the order Edentata; and the same situation is assigned to them by Mr. Swannock. Mr. Owen arranges them in the Ovoriviparous Subclass of Mammals, and, in the course of his valuable papers, exhibits their affinities to birds, reptiles, the Marsupial animals, and the ordinary mammiferous type.

The following cuts are taken from Mr. G. Bennett's paper in the 'Transactions of the Zoological Society.'

Ornithorhynchus feeding.

Ornithorhynchus sleeping.

* Ornithorhynchus.
parietal placenta, which spring up from the surface of the carpels in parallel lines covered with microscopic hairs containing a minute embryo lying in the abundant albumen. On account of their dinamous monopetalous flowers, they are usually staminated by systematic writers in the vicinity of Scrophulariaceae, but in many respects they correspond better with the typical form of Gentianaceae. The whole order is represented by the genus Orobanche itself, the various species of which, called Broomrapes, are found in fields, upon the roots of broom, furze, hemp, clover, bedstraw, &c. *O. rubra,* the handsomest of them, has hitherto been discovered only upon basil and spring upon basil and heath and on maritime and adjoining shores, and near Belfast. The quality of these plants seems to be generally astrin gent, but they have been but little investigated.

ORO'DES. [Crassus]

ORO'NOKO [O'Ronoco]

ORO'SIUS, PAULUS, a presbyter of the Spanish church, was born in the latter part of the fourth century, probably at Tarragona. About A.D. 414 he proceeded to Africa for the purpose of receiving instruction in the Christian faith; and having obtained this, he returned to Gaul on the northern coast of Britain, and there entered into the service of the Emperor Honorius, and was appointed bishop of Braga. He wrote a treatise against Pelagius, who was at that time spreading his opinions concerning original sin and grace, 'Liber apologeticus contra Pelagium de Arbitrii Libertate,' which is annexed to the 'History' of Orosius. From Palestine, Orosius returned to Hippo Regius, to his friend Augustine, and from thence to Spain. He now began to write his 'History of the World,' a work which he seems to have undertaken at the suggestion of Augustine, to whom it was dedicated. The work was published in A.D. 416, about which time it appears to have been completed.

The calamities which had befallen the Roman empire, and above all the capture and pillage of Rome by Alaric, A.D. 410, afforded to the heathen and to Symmachus, who was consul at Rome, the opportunity of accusing the Christian religion of being the cause of all those disasters, and of saying that since the abandonment of the old religion of the state, victory had utterly forsaken the Roman armies. It was for the purpose of replying to these accusations that Orosius wrote his history, which may be considered in part as an apology for Christianity against the Pagans, as the title, which has been found in several MSS., expresses, 'Adversus Paganos Historiarum libri viii.' In some MSS. the title is, 'De totius Mundi Calamitatibus;' in others, 'De Christianis et Miseris Antiquorum.' The work consists of seven books, divided into chapters. It begins with a geographical description of the world, then treats of the origin of the human race according to the Book of Genesis, and afterwards relates the various accounts of the mythologists and poets concerning the heroic ages. Then follows the history of the early monarchies, the Assyrian, Babylonian, and Persian, the conquests of Alexander, and the wars of his successors, as well as the early history of Rome, the contents being chiefly taken from Trogus Pompeius and Justinius. The fourth book contains the history of Rome from the wars of Pyrrhus to the fall of Carthage. The fifth book comprises the period from the taking of Corinth to the war of Spartacus. Orosius quotes his authorities, several of which are now lost. The fifth book begins with the war of Sulla against Mithridates, and ends with the birth of our Saviour. The seventh book contains the history of the empire till A.D. 416, including a narrative of the taking and sacking of Rome by Alaric, which was a great event of the age. Orosius intermixes with his narrative moral reflections, and sometimes whole chapters of advice and consolation, addressed to his Christian brethren, and intended to confirm their faith amidst the calamities of the times, which, however heavy, were not, as he asserts, unprecedented. Roman, he says, in their conquests had inflicted equal if not greater wrongs on other countries. His tone is that of a Christian moralist impressed with the notions of justice, re
turbation, and humanity, in which most of the heathen historians show themselves deficient. He deprecates ambition, conquest, and glory gained at the expense of human blood and human happiness. As an historian, Orosius shows considerable critical judgment in general, though in particular passages he appears credulous in chap. x. of the first book, where he relates from report that the marks of the chariot wheels of Pharaoh's host are still visible at the bottom of the Red Sea. As an instance of the incidental value of the passages taken by Orosius from older writers, see Herod. (ii. 81) speaks of Orphic and Bacchic mysteries.

Krug Alfred made a free translation of the History of Orosius into the Anglo-Saxon language, which has been published by Daines Barrington, with an English version of i. 8vo. London, 1808. The best editions of Orosius are that of Leyden, 4to, 1738, with Haverkamp's notes.

ORPHEUS (Ὀρφεύς), a poet, musician, and philosopher, whose name is very prominent in the early legends of Greece. The traditions concerning him are remarkably obscure. According to Cicero (De Nat. Deor., i. 38), Aristotle believed that no such person as Orpheus the poet had ever existed; but perhaps he only means that the poems ascribed to Orpheus were spurious: he is mentioned as a real person by Pindar, the historian Hellenius and Pherecydes, and the Athenian tragedians: he is not mentioned by Homer or Hesiod. Some ancient writers reckon several persons of the same name, and Herodotus speaks of two. In later times, a number of stories connected to him have been added to his mythology. The following is an outline of the legendary history of Orpheus. His native country was Thrace. It is a remarkable fact that most of the legends respecting Greek civilization are connected with the Thracians, who, in later times, spoke a language resembling that of several peoples in the ancient world. He is first seen upon by barbarians. Müller explains this by pointing out that the Thracians of these legends were not the same people as those of the historical period, but a Greek race. Orpheus followed the traditional route of the Argonautic expedition, about twelve or thirteen centuries before Christ. He was the son of Apollo and the muse Calliope, or, according to other accounts, of Oeaeus and a muse. The poets represent him as a king of Thrace, but the historians are agreed that, as a youth, he went to Egypt. Celsus, the historian of Alexandria, he was the disciple of Musaeus, but the more common accounts make him his teacher. He was one of the Argonauts, to whom he rendered the greatest services by his skill in music; the enchanting tones of his lyre made the foundations of their ship firm and safe; he also removed many dangers and difficulties while on their voyage, and mainly contributed to their success in obtaining the golden fleece. (Orphai Argonautica.) After the voyage, he returned to the court in Thrace, in which he commonly dwelt. He is said by some authors to have made a voyage to Egypt before the Argonautic expedition. Orpheus had for his wife a nymph, named Eurydice, who died from the bite of a serpent as she was flying from Aristas. Orpheus followed her to the world beneath, and by the power of his lyre induced Pluto and Proserpine to restore his wife, but upon the condition that he should not look back at her till he had past the boundaries of Pluto's realm. He broke the condition, and she vanished from his sight.

Orphic or Herodotean religion or mystery religion is an account that he was torn in pieces by the Thracian women at a Bacchic festival, in revenge for the contempt which he had shown towards them through his sorrow for the loss of Eurydice. (Apoll.

The foundation of mysteries is ascribed to him. (Aristoph.

ORPHEIC, certain works falsely ascribed to Orpheus, which embodied the opinions of a class of persons whom Müller thus describes:—'These were the followers of Orpheus (ὄρφεοι); that is to say, associations of persons who were devoted to the religion of Orpheus.' Among the sects which were attached to the worship of Orpheus, one was the Cieborean, which was called the Cieborean Orphic.' ('History of the Literature of Greece,' in the Library of Useful Knowledge, p. 231, &c., where the reader will find a full account of the Orphic theology.)

Of the Orphic writers the most celebrated are Onomastus, who lived under Ptolemaus and his sons, and Cercops, a Pythagorean, who lived about b.c. 504. Works ascribed to Orpheus were extant at a very early period. Plato mentions several kinds of Orphic mysteries, some of which were not genuine. Aristotle speaks of them as the so-called Orphic poems (ῥα ἀληθής). In later times all manner of works on mysteries and religion were ascribed to Orpheus. There are also Orphic poems later than the Christian era, which are difficult to be distinguished from those of earlier times. In Fabrius's Bibliotheca Graeca,
there is a list of the writings ascribed to Orpheus, of which the following are the principal.

1. Ινην Χθονος (taured legend), a complete system of Orphic theology, in twenty-four books: it is ascribed to Cercops and Dionysius, and is probably the production of several authors.

2. Τελας (religious rites, or mysteries), directions for worshipping and appeasing the gods; probably by Onomacritus.

3. Χαρα (prophecies). Similar works were ascribed to Mousias.

4. Αλκεα, probably stories of Bacchus and his mysteries, ascribed to Arigotes, a pupil or daughter of Pythagoras.

5. Η Χαίδων καιδες (the descent to Hades), a poem of great antiquity, ascribed, among other authors, to Cercops.

6. Τυμνα, also of high antiquity. In the time of Plato they were recited by rhapsodists at the public games. Onomacritus appears to have been the author of many of them.

7. Of Stones, their nature, and their powers against serpents and poisons, and for appeasing the anger of the gods.

8. Argonauta, a poem on the voyage of the Argonauts to Colchis; probably by Onomacritus; at least by some one not earlier than Homer.

9. Orphica, were written by Homer, in which it is said those his contemporaries, would doubt whether reason had presided over its construction. Yet these people (the Epicureans) doubt whether the universe, whence all things arise and are made, is not the effect of chance or of some necessity rather than of reason and a creative power. For though some的城市 in showing the magnitude of praise in imitating the changes of the sphere than nature in producing them.' (De Nat. Dorn, lib. ii., cap. 34 and 35.)

The earliest machine which represented the Ptolemaic system may possibly have been that possessed by Chromatius, but in the construction of instruments of this kind it is unnecessary to mention the weight of gold are said to have been used. This system continued to be represented in all planetary machines till about fifteen years after the death of Copernicus, when the last of that kind of any note was erected in the library of the Pantheon at Rome, to the order of Pius III. 

In the latter part of the seventeenth century Huyghens and Roemer employed themselves in the construction of planetary machines in conformity with the Copernican doctrine. The one invented by Huyghens, who first introduced a systematic method of calculating with precision the necessary wheel-work for these machines, received from its author the name of 'the Automaton.' It derived its motion from a spring regulated by a balance, the pendulum not having been then introduced as a regulating agent, and from a weight placed at the point, corresponding to the phenomena they are intended to exhibit, and which, when combined so as to derive their motions from a common origin, constitute what is now generally understood by an orrery. The machines are the Planetarium, Tellurian, Lunarian, and Sunbird machines. The tellurian and lunarian, when connected in their improved form, exhibit the motion of the moon about the earth and that of the earth about the sun, and the principal phenomena which accompany the changes in their relative positions, such as the succession of day and night, of spring, summer, autumn, and winter, the rise and setting of the stars, and the phases of the moon. The year of the year, the eclipses of the sun and moon, the variations in the moon's latitude, velocity, and distance from the earth, the progress of motion of her apogee, and the retrogression of her nodes, &c. The satellite machine is chiefly intended for exhibiting the positions of the planets in their primary, combined with the motions of the latter about the sun. Instead of attempting a particular description of any one of these machines, which could only be rendered intelligible by reference to many diagrams, while the object would be much better attained by a simple inspection of the machine itself, we shall confine ourselves to a brief notice of their history and to the explanation of the general principles upon which the construction of modern planetary machines is based, referring our readers for more ample information to the work ' Planetary Machines' in Brewster's Cyclopedia, contributed by the Rev. W. Pearson, formerly treasurer of the Astronomical Society.

The origin of the term 'orrery' is thus given by Mr. Desaguliers, in his Course of Experimental Philosophy.

'...And the first invention of it was described by Mr. Prince Eugene, and made by Mr. Mr. J. Rowley the praise due to Mr. Graham.'
Proceeding to this, we would caution the purchasers of these expensive toys (those exhibited in the shops of mathematical instrument makers vary in price from sixteen to forty guineas) against a defect which was at one time not uncommon and may still exist, and which, while it rendered them worse than useless, showed how little knowledge their creators could have possessed of the science they are intended to illustrate. We allude to the sidereal revolution of the planetars, whereby each planetary ball was made to revolve about the sun in the time which ought to have elapsed between two consecutive conjunctions of such planet with the earth.

To produce this revolution of the planetary balls about the sun, a system of vertical concentric tubes is usually employed, which are adjusted very near to each other, but yet so far removed as not to influence each other's motion. These tubes are of different lengths, the innermost being the longest, and to the superior end of the highest 12, the radius vector is attached, and the ray made to revolve once during each revolution of the tube. The lower extremities of the tubes form the arms or axes of as many toothed-wheels, which are either immediately driven by pinions adjusted to a vertical axle called the 'annual arbor,' or derive their motions indirectly from those pinions by means of an interposed train of wheels. The determination of the relative number of teeth which must be given to the wheels and pinions in order to produce any required motion may be thus explained.

In general, a wheel consists of a less number of teeth than that which it drives, but in the present article this restriction is unnecessary. The teeth of a pinion are called leaves. The number of revolutions made by the wheel during one revolution of the pinion, which it drives, is found by dividing the number of leaves in the pinion by the number of teeth in the wheel:—thus, if there be 35 leaves and 7 teeth, the wheel will make 35 revolutions during one revolution of the pinion; but if there be 7 leaves and 35 teeth, the wheel will make 7 revolutions during one revolution of the pinion.

If to the axle of the wheel be adjusted a second pinion, which drives a second wheel, and if to the axle of this wheel a third pinion be adjusted which drives a third wheel, and so on, then the number of revolutions made by the last wheel during one revolution of the first pinion will be found by multiplying together the number of leaves in the several pinions, and dividing the result by the number of teeth in the several wheels:—thus if there be four pinions, having 7, 8, 9, and 10 leaves respectively, and the same number of wheels, having 20, 21, 22, and 23 teeth respectively, the number of revolutions made by the last wheel during one revolution of the first pinion will be

\[
7 \times 8 \times 9 \times 10 = 50,400
\]

or, in other words, the last wheel will revolve eight times during 253 revolutions of the first pinion. Conversely the ratio which the product of the number of leaves must bear to the number of teeth, in order to produce any required relative motion between the first pinion and the last wheel, is found by dividing the number of revolutions made by the wheel by the number of revolutions to be made in the same time by the pinion. The actual number of teeth to be given to wheels and pinions, as they are employed in any particular case, is matter of convenience, not of necessity: in every instance the employment of a single pinion and a single wheel is theoretically sufficient, but in practice it is generally found that the use of a number of wheels and pinions with a very large or very small number of teeth. In the planetarium of the Royal Institution the number of teeth is in no instance under 7, or above 127. In a more complete instrument, constructed under the superintendence of Dr. Pearson in 1813, the limits were 14 and 241. The same general recommendations about 10 teeth to the inch, which are the considered sufficiently strong, and not liable to unnecessary shake, when the teeth and spaces are made equal and at a proper depth for action. The lowest number employed by him was 7 to the inch.

Supposing we, and the radius which carries the ball representing the earth to revolve once during each revolution of the annual arbor, it is only necessary that the wheel which is adjusted to the lower extremity of the earth's tube should contain the same number of teeth as the pinion by which it is driven, and which is adjusted to the annual arbor. In this case each revolution of the annual arbor will be the measure of one solar year. If each revolution of the annual arbor be required to represent any asigned portion of a year, the necessary modification in the relative number of teeth in the earth's wheel and pinion will appear sufficiently obvious from what has proceeded; but for the sake of simplicity, we shall assume that the earth's radius vector revolves exactly once during each revolution of the annual arbor, and upon this supposition we have now to find the relative number of teeth which should be given to the wheels and pinions which regulate the motions of the other planetary balls. It generally happens that the number of revolutions which the radius vector of any one of the planetary balls is required to make during one revolution of the annual arbor is expressed in the form of a decimal. Suppose, for instance, that the relative motion required were that of the earth and Jupiter. Jupiter revolves in 4332½ days mean solar days; the earth in 365½ days mean solar days; the number of revolutions made by Jupiter during one revolution of the earth is therefore

\[
4332\frac{1}{2} = 0.434345
\]

If this decimal be converted into a continued fraction by the rule given at page 402, vol. x. the resulting series of fractions, which approximate more and more nearly to 0.434345, will be found to be

\[
11\ 12\ 83\ 344\ 1115\ etc., etc.
\]

any one of which, according to the degree of accuracy required, may be taken for the ratio which the number of leaves in the pinion must bear to the number of teeth in the wheel, if only a single wheel and pinion be employed, or the ratio which the product of the number of leaves must bear to the product of the number of teeth, if a train of wheels and pinions be employed. If the first of these fractions, or its equivalent, 77 be taken, the wheel attached to Jupiter's tube should contain 77 teeth, and the pinion attached to the annual arbor by which it is driven should contain 7 leaves, and Jupiter's radius will then revolve once during 11 revolutions of the annual arbor, that is, in 365½ days = 4017½ days, which is less than the true period by 314½ days. In the same manner may be found the time in which Jupiter's radius will revolve when any of the other fractions are taken, as under—

<table>
<thead>
<tr>
<th>Period produced.</th>
<th>Error.</th>
</tr>
</thead>
<tbody>
<tr>
<td>365½ days</td>
<td>0.434345</td>
</tr>
<tr>
<td>day</td>
<td>1</td>
</tr>
<tr>
<td>365½ days</td>
<td>0.433089</td>
</tr>
<tr>
<td>day</td>
<td>2</td>
</tr>
<tr>
<td>365½ days</td>
<td>0.433289</td>
</tr>
<tr>
<td>day</td>
<td>3</td>
</tr>
<tr>
<td>365½ days</td>
<td>0.433256</td>
</tr>
<tr>
<td>day</td>
<td>4</td>
</tr>
</tbody>
</table>

The third of these fractions, or rather its equivalent, 166 was the one employed by Dr. Pearson in the construction of his new planetarium; so that in that instrument the wheel attached to Jupiter's tube contains 166 teeth, and is driven by a pinion of 14 leaves attached to the annual arbor. In the planetarium of the Royal Institution, a train of wheels and pinions represented by the compound fraction 111 94 33 22 40 was employed, which therefore gives a period of 365½ days = 4330.775 days. The following table affords a general view of the wheel-work of the last-named instrument. The denominator of the first two fractions in the second column denotes the number of leaves in the pinion attached to the annual arbor; the numerator, the number of teeth in the wheel which it drives. The denominator of the second fraction denotes the number of leaves in the pinion attached to the axle of the last-mentioned wheel; the numerator, the number of teeth in
the wheel driven by this pinion, which wheel is attached to the lower extremity of its appropriate planetary tube.

| Mercury | 22 67 | 87 972 | 87 969 | 0 003 + |
| Venus   | 32 63 | 224 705 | 224 701 | 0 004 + |
| Earth   | 60 60 | 365 256 | 365 256 | 0 000 |
| Mars    | 56 56 | 686 958 | 686 950 | 0 022 + |
| Ceres   | 121 48 | 1683 650 | 1661 393 | 2 265 + |
| Pallas  | 21 98 | 1666 593 | 1683 494 | 58 881 |
| Jupiter | 149 98 | 1429 778 | 1432 943 | 1 607 |
| Saturn  | 59 98 | 1074 720 | 1079 522 | 12 01 + |
| Ixion   | 105 67 | 3050 22 | 3066 82 | 96 60 + |
| Sun     | 19 21 | 25 418 | 25 418 | 0 418 + |

The planets Vesta and Juno had not been discovered at the time this machine was constructed.

The contrivance by means of which a true elliptic orbit may be produced is extremely simple. For this purpose all that is necessary is that the radius vector which connects the centre with any point on the orbit should consist of two parts or arms, the lengths of which have a determinate ratio dependent solely upon the eccentricity of the orbit, and that while the larger arm revolves about the centre of the ellipse by means of the wheel-work already described, the smaller arm remains fixed, which has the extreme of the larger with the same angular velocity but in the opposite direction. This may be effected in two ways. By means of a pulley fixed to the planetary tube and connected by an endless silken cord with another pulley free to revolve about a vertical axle situated at the extremity of the larger arm. The effect of this connection will be that the latter pulley will revolve once during each revolution of the larger arm but in the opposite direction. If therefore the smaller arm be attached to this pulley it will revolve in the manner required. The same motion may be produced by employing a double pinion extending the entire length of the larger arm and communicating the rotatory motion given to it at one extremity, to the axle of the smaller arm situated at the other. Let R and r denote the lengths of the larger and smaller arms respectively, and let the line joining the position of the sun and the centre of the concentric tubes, considered as the origin of co-ordinates, be taken for the axis of x. The aphelion of the orbit will be the point (R + r, 0, 0). Also the inclination of the larger arm to the axis of x at any moment; then since the smaller arm revolves with the same angular velocity, but in the opposite direction, its inclination to the axis of x at that moment must be denoted by −θ, and the coordinates of the extremity of the smaller arm, that is, of the position of the planetary ball, will be the sum of the projections of R and r upon the axes of x and y respectively. Representing these co-ordinates by x and y, we shall therefore have

\[ x = R \cos \theta + r \cos \theta (R + r) \cos \theta \]
\[ y = R \sin \theta - r \sin \theta (R + r) \sin \theta \]

The overlight added to the p. 30, that of mistaking the symbol for the reduced period, does not appear to have been altogether avoided in the construction of the planetarium of the Royal Institution, the wheel-work of which is supported on the top of the chamber by the outer tube of its revolution about the sun in 365.24 days. This is the length of the tropical year, or the time which elapses between the earth's leaving the vernal equinox and its return again at that point of the ecliptic; and it is, owing to the procession of the equinoxes, less than the earth's sidereal period.

1. In the description of the planetarium of the Royal Institution, to which we have been able to refer, the wheel-work of Saturn is represented by X

90 and that of the sun by 19 25 X 11 1097-22 days, the latter of which we have little doubt that the numbers we have substituted for 17 and 62 are those which were actually employed. It is moreover to be observed, that the time occupied in the motion of the planet direct from Mercury's tube, to which first pinion of the train, denoted by the number 127, is attached, thereby producing a period of 119 days.

| Mercury | 22 67 | 87 972 | 87 969 | 0 003 + |
| Venus   | 32 63 | 224 705 | 224 701 | 0 004 + |
| Earth   | 60 60 | 365 256 | 365 256 | 0 000 |
| Mars    | 56 56 | 686 958 | 686 950 | 0 022 + |
| Ceres   | 121 48 | 1683 650 | 1661 393 | 2 265 + |
| Pallas  | 21 98 | 1666 593 | 1683 494 | 58 881 |
| Jupiter | 149 98 | 1074 720 | 1079 522 | 12 01 + |
| Saturn  | 59 98 | 3050 22 | 3066 82 | 96 60 + |

The distance E, between the position of the ball representing the sun and the common centre of the tubes is expressed by

\[ E = 2\sqrt{R \cdot r} \]

This method is defective in two respects. The elliptic orbits described cannot have a common focus, or else the true relative lengths of the mean distances of the planets cannot be preserved; and secondly the true angular motions of the planets at the sun are not known. The distance E is far inferior to that which the student may form in his own mind from an attentive perusal of a good popular treatise upon the subject.

ORRERY, EARL OF.[BOWL.

ORSINI, PAPAL HISTORIAN, and illustrious family of Southern Italy, which has had among its members several popes, many cardinals, and other distinguished individuals. Orso Orsini, of Petigliano near the lake of Bolsena, is mentioned as senator of Rome in the years 1190-1200. His son Giovanni, known as Orsino Orsini, to whom was assigned the title of cardinal, left two sons: 1, Napoleon Orsini, Count of Tagliacozzo in the kingdom of Naples; and 2, Matteo, styled 'the Great,' senator of Rome, and lord of Amagni, Marino, Gelati, and other fiefs in the Campagna of Rome. Matteo left several sons, one of whom, Giovanni, born Pope under the name of NICHOLAS III. A branch of the family entered the service of the Anjou kings of Naples, obtained high honours at that court, and the titles of Counts of Nola and Marches of Gargano. The Orsini who resided in the Papal State were often at variance with the powerful family of Colonna during the middle ages. The castle of Bracciano, on the lake of that name, was the chief residence of the Orsini. In January, 1503, Francis Orsini, duke of Gravina, who had been made a cardinal, was captured and strangled at Sineaglia by Cesare Borgia, whilst the cardinal Orsini was poisoned at Rome by order of Cesare's father, Pope Alexander VI. By degrees the various branches of the Orsini became extinct, and their estates passed into other hands. The last Orsini to bear the name of the dukes of Gravina, which still continues, the actual duke having married a daughter of the banker Tocchini, duke of Bracciano. The palace Orsini at Rome, a vast building, stands on the ruins of the Theatre of Marcellus. The family palace at Naples, belonging to the duke of Gravina, is one of the finest private buildings in that capital. (Imhoff, Genealogies: Morelli; Almanach de Gotha.)

ORSINI, FULVIO, said to have been an illegitimate member of the noble family of that name, was born at Rome about 1255, and became canon of the cathedral church of Santa Croce in Gerusalemme, where he was well versed in classical literature, both Greek and Roman, and collected a valuable library of MSS., which he bequeathed to the Vatican library. He was intimate with Dante, and was canon of Santa Croce in Gerusalemme, and was considered one of the first scholars of his age. He died at Rome, about the year 1660. He wrote several learned works: 1, 'Familiae Romanae quae repertur in antiquis Numismatibus, ab Urbe Condita ad tempora Divi Augusti,' cum adjunctis Antonii Augusti et Lunicius Iherdinens, fol. Paris, 1663; 2, 'Virgilius collatione Scriptorum Graecorum illustratur,' in which he points out the numerous passages in which Virgil has imitated or borrowed from the Greek poets; a very interesting commentary; 3, 'Selecta a Legationibus ex Polybi e Fragmenta ex Historiarum quin e non certiori Dioniis Tellacares, Diodori Sculi, Appiani Alexandri, Dionis Cassii,' &c., 4to, Antwerp, 1552, in Greek, with Latin notes, 4to; "Carmina novum illustrium Fenianurum Graecorum," 8vo, Antwerp, 1566, and other minor publications.
ORTALIDIA. [CRACIUS, vol. viii, p. 131.]

ORTIUS, ABRAHAM, born at Antwerp in 1527, of a family originally from Augsburg, studied philology and mathematics, and became the first geographer of his age. After travelling through England, Germany, France, and Italy, he published his greatest work, his "Ortographia," a description of the globe, or universal geography. He was soon after appointed geographer to Philip II. of Spain. His other works are:—1, "Deorum Deorumque Capit et vesteribus Numismatibus"; 2, "Aurei Sacelli ImagEs, sec Gandavense, 1618; 3, "Inveniuntur per nonnullas Galliae Belgicae Partes." Ortius was acquainted with most of the learned men of his age, and was particularly intimate with Justus Lipsius, who wrote his epitaph. He died in 1598.

Sweert's Fita Ortu, 1609.

ORTHE'S, or ORTHEZ, a town in France, capital of an arrondissement in the department of Basses Pyrénées, 500 miles from Paris, on the road by Poitiers, Bordeaux, and Mont de Marsan to St. Jean Pied de Port and Pamplona in Spain, and at the intersection of a cross-road from Bayonne to Pau. The town is pleasantly situated on the right bank of the Gave de Pau, which flows between steep banks of limestone. There is a suburb on the left bank, which communicates with the town by an ancient Gothic bridge. The streets of the town are well laid out, and the houses tolerably well built. There are some ruins of the ancient castle of Moncade, on a height commanding the town. The population of Orthez, in 1822, was 9,557; in 1836, it was 16,587 for the commune; in 1846, it was 17,857 for the commune. The townsmen carry on trade in salt provisions, especially hams. The manufacture of linen, especially of table-linen, flourished formerly, but has much declined; that of woolen stuffs and穿着 is carried on by the women. There are tanneries and currying-shops. The market for cattle and corn is considerable, and there are two large yearly fairs. Slate and coal are quarried in the neighbourhood, and sulphur and petroleum are procured. Six roads converge at the town. The post-office is attended to by a postilion, and the banks of Dax, then to the princes of Bearn. Jeanne d'Albert, queen of Navarre, founded here a university for the Protestants, who then predominated in the town, and who still form a fourth or a third part of the inhabitants. They have a charter granted by the Holy Society, a high school, and several government offices.

A severe action was fought near this town 27th February, 1814, between the allied forces under the Duke of Wellington and the French under Marshal Soult. The French were repulsed, and lost nearly the whole of their army. The Duke of Wellington, having brought seven divisions of British and Portuguese infantry and two brigades of cavalry to bear on the position of the French, dislodged them from all their posts, and obliged them to retreat, and the French suffered very considerably by desertion; the loss of the British was about 2300. (Duke of Wellington's Despatches.) Some French writers, as Malte Brun and Vayssé de Villiers, have given a very exaggerated statement of the number and the loss of the allies.

The arrondissement of Orthez contains 152 communes, and comprehends an area of 454 square miles; it is subdivided into seven cantons or districts, each under a justice of the peace. The population in 1831 was 84,853; in 1836, 87,452. Orth is a white stone, used for the construction of houses, and for fuses into a blackish globule, with borax it gives a transparent glass. Gelatinous in acids and yields a solution of cerium. It is found at Finno, near Fahlum in Sweden, and also in Greenland. &c.

Analysis of the mineral from Finno, by Berzelius:—

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica</td>
<td>36.25</td>
</tr>
<tr>
<td>Protode of Cerium</td>
<td>17.39</td>
</tr>
<tr>
<td>Protode of Iron</td>
<td>11.42</td>
</tr>
<tr>
<td>Alumina</td>
<td>14.06</td>
</tr>
<tr>
<td>Vitriol</td>
<td>12.93</td>
</tr>
<tr>
<td>Oxyde of Manganese</td>
<td>1.36</td>
</tr>
<tr>
<td>Water</td>
<td>8.70</td>
</tr>
</tbody>
</table>

P.C., No. 1044.

ORTHOCERAS. [POLYTHALAMACEA.] ORTHOGONAL, ORTHOGRAPHIC. The first of these terms, when not used in the same sense as the second, means simply perpendicular. Thus a curve cuts a set of curves orthogonally when it cuts them all at right angles.

Orthogonal projection is a system of projection that is made by drawing lines from every point to be projected, perpendicular to a plane of projection. Thus if a plane were horizontal, and a point were to drop from a given position upon the plane, its last position would be the orthogonal or orthographic projection of its first position.

ORTHOGRAPHY. When this word is looked at in its elements (two Greek words denoting the art of writing and correctness), it would seem that there ought to be included under it whatever belongs to the art of writing a language correctly, including both its written syntax and syntax. But the grammarians have given it a restricted sense, and it is used to denote not the writing correctly in the general, but the proper selection of literal elements of each word that is used, and the proper division of each word when one part of it is at the end of one line and another at the beginning of the line which succeeds. In the ancient Hebrew manuscripts we may observe that this division of words never occurs, the scribes resorting to the expedient of widening certain of the letters, if in the ordinary form of writing the word did not fit the line. The scribes and stationers in their copies of legal documents fill up a line with a waved and unmeaning stroke, when the word which follows cannot conveniently be written in it at length.

To be more precise, we perceive by certain grammars and dictionaries published by practical persons, that the English language is a vehicle of thought, and that the United States of North America, that the writers appear to suppose that their works will be read to even by persons of cultivation as authorities or guides to orthography. But we believe it to be the opinion of the great majority of the persons who actually use dictionaries for this purpose. We mean of course not mere children or persons of very imperfect education, but even of those there are very few persons who read much and write occasionally, who ever think of language and the kind of speaking of, and the persons of a better education still trust entirely to memory, and should a doubt arise, the reference would be made to some eminent author and not to the guides of which we speak. In fact, the art is acquired almost without teaching, and is maintained in vigorous health through the constant practice of writing and reading. At all events there is no book, grammar, guide, or dictionary, which a scholar in England regards as in this point a book of any authority.

Whether it would be expedient to raise some one work into an authority in such a point as this, is in fact a question—one of the greatest in philology that can be proposed—whether there shall be an invariable standard established to which a living language shall for ever conform. We doubt not, in the present state of things, the respect of orthography, we are quite sure that no such standard can be raised, because it would be quite impracticable to bring all persons who have a right to a voice in such a matter to an agreement in any one system involving the admission of certain fixed principles. The contemporary usage of persons of cultivation, meaning of a great preponderating majority, which will always exist, is, we apprehend, the authority to which each person who aspires to write correctly in English must look.
it as respects the writers before the time of Caxton and the invention of printing, and we may reasonably wish that with reference to them there had been some less varying standard and a continuous uniformity; but when we look in the writings of the Latin of the Elizabethan period through which we find that though now two centuries and a half have passed, there is no more difficulty in perusing them there than in perusing the writings of our own day; and that the same will be the case in respect of the writings of the present day in the English language, it is more than likely that we may be safely foretold. So that there is no real prejudice arising from the apparently unphilosophical and dangerous course of leaving this point to be regulated by anything so uncertain as contemporary usage.

At present the number of words of which the orthography is not uniform in all writings which aspire at once to be correct and devoid of affectation, is exceedingly small. Take this sentence and the whole of the paragraph which precedes it; there is in it exactly three words, under which the word order has changed, in which the travel has been made in order to render the orthography uniform, and it is not certain that this is the case in any other writing of the same kind in which this is the case, and it is very possible that in a case of this kind it is not certain that this is the case in any other writing of the same kind in which this is the case, and it is very possible that in such a case there is no instance in which the orthography is not uniform, and it is very possible that in such a case there is no instance in which the orthography is not uniform.

It has been matter of complaint that the orthography of the English language is not more uniform; that is, that the words which are composed in whole or in part of the same elements are not uniform in the manner in which those elements are employed. Thus all words derived from the Latin caedere with prepositions prefixed, it may be said should be treated in one and the same way; and it is a want of uniformity of which nothing can be well pleased that we should write proceed and yet write also concede. So with respect to such words as honour, favour, odour, labour, it may be said that there should be uniformity with other words like them, in which the is not found, and further, that we should keep to the orthography of the Latin words of which they are forms equally in meaning and orthography. This appears plausible, but when it is considered that these words do not come to us under such a form, but have been brought in by the French, we have no certain idea of the history of the word, which a person of true taste would scarcely be willing to relinquish for an advantage so trivial. Or take the rough word through: some may think that the three last letters may well be dispensed with, but they remain a pleasing evidence of the origin of the word in the rough and strong speech of its Saxton ancestors.

These little irregularities in orthography, like irregularities in other parts of grammar, are to be regarded as evils. Such irregularities give birth to what are called idomes, in which no small part of the beauty of a language lies.

Attempts have however been made by ingenious men to introduce a greater degree of uniformity into our orthography. The treatise on this subject printed about two centuries ago, in which we have a peculiar orthography on a system of the author's own, Ritson, in the last century, in some of his works adopted an orthography of his own. Professoral writers on grammar have done their best. Some of them to uniformity; but the French, as written by them, can scarcely be known to be English. A more moderate reform is attempted by an American writer, Dr. Noah Webster, the author of the Young American, in which have been introduced by Mr. Bromly of Hull, and learned and ingenious clergyman, has printed for private circulation a translation of the treatise of Piutech concerning music, in which the orthography is regulated by certain principles which he lays down, although he has not made such an attempt has ever gained in any way the slightest share of public attention. Practically the usage is thought or found to be sufficient.

There is one point to which persons who take this view of the subject do not seem sufficiently to attend, and that is, the havoc which any material changes in our orthography, so as to reduce it to some one system, would make in the beautiful poetry by which our language was adorned, and which will preserve it at once from extinction and from any very material changes.

The words are in reality very few of which the orthography may not be said to be now established, by the principles of Norma Linguarum, and which are as likely to be found written with honor, honor, inquire, inquire, negato, negato, control, control, expense, expense, allege, allege, complete, complete, connexion, connexion, abridgment, abridgment, surprise, surprise. Of course some of these are not very correct. But what are these to the great body of such a language as ours? And with respect to the first and to the last, each of which represents a large family of words, we would submit that very few persons indeed who were entitled to judge, if there is such a form ever used. So that practically great and perhaps quite sufficient degree of uniformity and stability may be said to be secured under the regulating power which now exists.

These words and vocabularies, as affording an easy guide to the knowledge of what is the usage, may have their use in this respect to a few persons who write occasionally only; but as authorities, we repeat, they are of no avail.

It has been matter of complaint that the orthography of the English language is not more uniform; that is, that the words which are composed in whole or in part of the same elements are not uniform in the manner in which those elements are employed. Thus all words derived from the Latin caedere with prepositions prefixed, it may be said should be treated in one and the same way. And it is a want of uniformity of which nothing can be well pleased that we should write proceed and yet write also concede. So with respect to such words as honour, favour, odour, labour, it may be said that there should be uniformity with other words like them, in which the is not found, and further, that we should keep to the orthography of the Latin words of which they are forms equally in meaning and orthography. This appears plausible, but when it is considered that these words do not come to us immediately, but have been brought in by the French, we have no certain idea of the history of the word, which a person of true taste would scarcely be willing to relinquish for an advantage so trivial. Or take the rough word through: some may think that the three last letters may well be dispensed with, but they remain a pleasing evidence of the origin of the word in the rough and strong speech of its Saxton ancestors.

These little irregularities in orthography, like irregularities in other parts of grammar, are to be regarded as evils. Such irregularities give birth to what are called idomes, in which no small part of the beauty of a language lies.

Attempts have however been made by ingenious men to introduce a greater degree of uniformity into our orthography. The treatise on this subject printed about two centuries ago, in which we have a peculiar orthography on a system of the author's own, Ritson, in the last century, in some of his works adopted an orthography of his own. Professoral writers on grammar have done their best. Some of them to uniformity; but the French, as written by them, can scarcely be known to be English. A more moderate reform is attempted by an American writer, Dr. Noah Webster, the author of the Young American, in which have been introduced by Mr. Bromly of Hull, and learned and ingenious clergyman, has printed for private circulation a translation of the treatise of Piutech concerning music, in which the orthography is regulated by certain principles which he lays down, although he has not made such an attempt has ever gained in any way the slightest share of public attention. Practically the usage is thought or found to be sufficient.
ORT

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ill, he observes, is short, arched, and rassorial, the wings modeled, and the feet enormously large and strong. He notes the relative length of the toes as altogether peculiar, the outer one being actually longer (in a slight degree) than the middle one, while the two outer claws, which are unusually slight in their curvature, are one-third as long as the toe; the hallux he describes as long as the middle toe, but having one-half its length occupied by the claw. Mr. Swainson thinks it quite obvious that claws so constructed were never intended to be used for ascending trees, and yet the nudity of the tail would imply that this singular bird feeds in a semipendulous attitude, otherwise such a tail would be useless. The specimen before him when he wrote confirmed this suspicion, for the ends of the feathers, or rather the webs, were much worn away; and he conjectures, in the absence of information on the subject, that the habits of Orthonyx are terrestrial, that it is essentially a walking bird, but that it seeks its food not so much upon the bark of trees, as upon steep earthy banks, into which its unusually straight claws would penetrate, and against which the bird might be supported by its tail; and he thinks it also highly probable that these strong claws are used for scratching the ground, after the manner of rassorial birds. At all events he considers that the discovery of Scelurus establishes a link between Dendrocolaptes and Orthonyx, and he thinks that both are types of the Rattrays, the one in the circle of the Cserthiane, the other in that of the Bus- phynæa.

ORTHOPTERA, one of the orders into which insects are divided. This order, of which we have familiar examples in the common cockroach (Blatta), the house-cricket, and the grasshopper, is distinguished by the following characters: The superior wings are generally bearing numerous nervures in a longitudinal direction, and having the interspaces filled up with transverse, or reticulated, smaller nervures: the anterior portion of the inferior wings is generally of a different substance from the posterior portion, the nervures are more crowded, and in character, and often even in colour, it nearly resembles the anterior pair of wings; the hinder portion of these wings is almost always more transparent, and, when not in use, is folded like a fan. The superior wings often overlap horizontally, as in the cockroaches, but in many species they meet at an angle like the roof of a house, as in the grasshoppers and locusts. The legs in some are formed for running; in others, the hinder pair of legs are very long and the thighs of these legs are thick, and in fact formed for leaping. The antennæ do not vary much; they are usually filiform; in many, extremely long and slender, in which case they are composed of innumerable minute joints; in others, they are shorter and thicker, and the joints are less numerous and consequently more distinct. The parts of the mouth are well developed and approach in structure those of the order Coleoptera; they are usually however less firm and compact, especially the labial apparatus. The upper portion of the prothorax is generally very large. The metamorphosis of the Orthoptera is semi-complete, that is to say, the larva and pupa resemble the perfect insect, excepting that in the larva there are no wings, and in the pupa the wings are in a rudimentary state. Some species however in the perfect state are wingless, in which case it is extremely difficult, and perhaps impossible, to distinguish the perfect insect from the pupa or even the larva.

Latreille divides the order Orthoptera into two sections, to which he applies the names Cursoria and Sallatoria, or runners and jumpers. In the Cursoria all the legs are usually alike and fitted for running, and they are thus easily distinguished from the Sallatoria, in which the hinder legs are long and the thighs thick. The males of the species belonging to the second section have the power of producing a shrill noise, but this is not always effected in the same manner.

To the section Cursoria belong the families Forficulidae (for Earwigs), the Blattidae (Cockroaches), the Mantidae (or Mantis tribe), and the Phasmidae. The section Curtoria may be divided into three families—the Grylidae, the Locustidae, and the Acrididae (or Grasshoppers).

The principal characters of these families are given under the proper heads; they may be distinguished by the following characters:

A. Tarsi 3-jointed.
   b. Abdomen without forceps.
      ** Antennæ filiform or prismatic. . . . . Acrididae.
      ** Antennæ very long and setaceous
B. Tarsi 4-jointed, antennæ setaceous . . . . Locustidae.
C. Tarsi 5-jointed.
   a. The prothorax the longest of the three thoracic segments . . . Mantidae.
   b. The prothorax the shortest of the three thoracic segments . . . . Phasmidae
   c. The prothorax broad, more or less rounded, and generally covering the head . . . . Blattidae.

ORTHORHYNCHUS. [Troglinidae.]
ORTHOTOMUS. [Stylidae.]
O'RTOLAN, the French and English names for a spe-

* In one genus which is placed in this family (Heteropteryx) the posterior tarsi have only three joints.
cies of Frangilla, much esteemed by epicures for the delicacy of its flesh when in season. It is the Hortulanus of Gesner and others, Miliaria pinguescens of Frisch, Embe-
rizia hortulana of Linnaeus, Ornolus of the Italians gene-
nally, Tordino Berliaego of the Venetians, Garten Amner
and Pettastrum of the Germans, and Gene Kneo of the
Netherlands. Willughby writes the name Hortulanus,
and Montagu terms it the Green-headed Bunting.
Description.—Male. Throat, circle round the eyes, and a
narrow band springing from the angle of the bill; yellow;
these two yellow spaces being separated by a blackish grey
dash; head and neck grey, with a tinge of olive and small
brown spots; feathers of the upper parts reddish on their
edges and black in the middle; breast, belly, and abdomen
reddish bay, all the feathers of those parts being terminated
with ash-colour; tail blackish, a considerable portion of the
two external feathers white on their internal bars; bill and
feet inclining to flesh-colour; iris brown. Length rather
more than six inches.
Female smaller; band above the eyes and throat pale
yellow; breast marked with large brown spots; the other
parts below of a whitish rust-colour; a number of brown
spots on the head and neck; all the upper parts less deep
in colour than in the male.
Yoked before the mouth.—The yellow on the throat
but slightly visible and tinged with greyish.
Varities.—Pure white. The bodily partially white or
whitish, or simply flecked with white; Ornolus blanco de
Bufon. Other varieties (M. Vieillot enumerates six, one
of which, C, has the head and neck green) are re-
corded; the Embriilea Maltese, Sparr, Brunet de Malpy.
Sonn., for example. In many the colours are
deeper, and in some blackish or entirely black, appa-
rently from the quality of the food, as when the bird has
been fed with hemp-seed.
Food.—Millet and other farinaceous grains; insects, es-
cially in the early part of the season before the grain is
ripe.
Reproduction, Habits, &c.—The nest, which is con-
structed of fibres of plants and leaves, lined generally
with fine grass and hairs, is very frequently found on the ground
in corn-fields; though, according to circumstances, the bird
varies its site, and it is placed also in hedges or bushes. The
egg, which is usually one, is reddish-grey streaked with
brown; or bluish white speckled and spotted with black.
It haunts bushy places, or those situations where hedges
abound.
Geographical Distribution.—The south of Europe may
be considered the summer and autumnal head-quarters
of the Ortolan, though it is a summer visitor in the
central and northern parts. In Italy it is said to be com-
mon by Temminck and others. The Prince of Musignano
states that it is found in the Sabine Mountains, but not com-
monly, in the summer, and that it rarely occurs in the
plain of Rome, but that it is frequent in Tuscan. Lapland,
Rus


Orrus, or HORUS, an Egyptian deity, the son of Isis
and Osiris, corresponds, according to Herodotus, to the
Apollo of the Greeks, and was the last of the gods
who reigned in Egypt. (Herod., ii. 144; Diod., i. 44.)
Typhon, after the murder of his brother Osiris, sought to
kill Orus; but his mother Isis, according to Herodotus (ii. 156),
com-
mitted him to the care of Leto, who brought him up in the
moving island of Chemis, which was in the lake Buto.
The Egyptian priests however in this instance, as well as
in many others, appear to have been anxious to assimilate
the history of their deities as much as possible to that of
the Greeks. When Osus had grown up, he was said to
have made war upon Typhon, whom he deprived of the
kingdom of Egypt, and, according to some accounts, put to death.
(Diod., i. 25; Herod., ii. 144; Plutarch, De Is. et Osr.
p. 358, Francfort.)

According to Diodorus (i. 25), Orus was killed by
the Titans, and restored to life by his mother Isis, who conferred
upon him immortality, and taught him divination and
the healing art.
Orrus is frequently represented as sitting in the lap
of Isis. He appears also to be represented in some bronzes in
the British Museum, which depict a man trampling on the
crocodile, since we know that the crocodile was one of the
symbols of Typhon. (Egyptian Antiquities, 12mo, Lond.,
1836, vol. ii. p. 306.)
A work on Egyptian hieroglyphics has come down to us
purporting to be written by Orus, or Horus, of which
an account is given in the article HORAPOLIS.
ORVET, the French name for the Blindsword (Angus
fragilis of Linnaeus). [BLINDWORM]
MM. Duméril and Bibron, who, in their recently
published work (‘Histoire des Reptiles,’ tome v., 1839), place
the form among the Scincideae Lizards, and next to
Ophidors, state that up to the time of their publication all
authors have denied an external auditory opening to the
Angus fragilis, Linnaeus, whereas this Scincideae has one,
very small it is true, but distinct nevertheless when ears
are taken to search for it, even without the aid of a lens.
They state that this orifice, which is linear, and from one to
two millimetres in length, is situated behind the commissi
buildings of Orvieto are the town-house and the Jesseas college, and a very deep well, excavated in the tufo rock on which the town is built, with steps to the bottom. The country around Orvieto is fertile, and produces a kind of delicate white wine, which is in great repute at Rome.

Orvieto appears to have no well founded claim to classical antiquity, though some antiquarians have pretended that it is the same as Orpiment, a town of the antient Etruscans, of which nothing more than the name is known. Orvieto was called Urbis Vetus in the time of the Longobards, and mentioned by pope Gregory I. (Della Valle, Storia del Duomo di Orvieto, 4to, Rome, 1791.)

ORYTEROPUS [Aard-Vark.]
ORYTERUS. [MART. ANAT. p. 516.]
ORYX. [Antelopes. vol. ii. p. 87.]
ORYZ.A, the name by which rice was known to the Greeks and Romans, and which has been adopted by botanists as the generic name of the plant yielding that valuable grain. The Greek name would appear to be derived from the Arabic Arz, and this is allied to Ory, the Telting name of cultivated sorts; but the Sanscrit names are Unuo, Dhanay, Vrithi; the wild kind being called Nirara, while the great tanks are called ergos in the Tamil language. The European rice is generally considered to be of the same species, but the name paddy is applied to the rice in its natural state, or before being separated from the husk. The natives of India call it dhon in this state, as well as the plant, and the rice itself is called chunnaw.

The genus Oryza consists of one species, Oryza sativa, a tall annual grass, that bears a large white or yellowish spike of flower; palea two, nearly equal, adhering to the seed; stamens six, and styles two. Dr. Roxburgh describes two species: one, O. sativa, distinguished by its diffuse panicle; the other, O. frutescens, has the spike more or less contracted, the calyx subulate, and the leaves culm-clasping. This second species is a native of the delta of the Ganges, and was first discovered there by Dr. Buchanan in 1796, but was not found to be applied to any use.

The rice plant, therefore an undoubted native of India, from which country it has spread over a great part of the world, especially in Asia, where it forms the principal portion of the food of the inhabitants, but it has also from very early times been introduced into the southern part of Europe. It is cultivated in Japan, Ceylon, S. India, C. 5, with other Indian plants, and mentions it as growing in the water, and that its inflorescence is like that of milium or panicum, and not in form of a spike. Adams Smith adds it as one of the most profitable of grains. A rice crop of 400,000 acres produces a profit of six millions, and is the most fertile corn-field. Two crops in the year, from thirty to sixty bushels each, are said to be the ordinary produce of an acre. Rice is now extensively cultivated in North and South Carolina, and in Georgia; also in Italy and the south of Spain, and little in Germany. The perfect system of irrigation and tilework which was introduced into Italy at so early a period no doubt rendered the cultivation easy, as the climate is also sufficiently hot and regular.

As the summer temperature of many countries is high, it is easy to cultivate rice in the open ground, and it requires but a scanty and irrigation easy; but as the summer temperature of most European countries is too low, and not long enough continued, and far from regular, it is hopeless to attempt the culture of a grain which requires in England, and which has the disadvantage, from the moisture arising from irrigation, of making a country unhealthy; but this is not the case in the rainy season of tropical countries, where the rice-field is not much more moist than the rest of the country. Its culture has been attempted in England, and a small crop was raised near Windsor, on the banks of the Thames; and it has been hoped that the mountain rice, which is known to grow at considerable elevations in the Himalayan Mountains, might be suited to an English climate. This variety of rice has been introduced into Europe, but it seems to be forgotten that temperature is only one of

Mr. Bell is of opinion that Blindworms in a state of nature do not live upon slugs exclusively; he found the remains of snails in the stomach, and adds that they will feed readily on any part of the snail, from the snaillings on; but they cannot swallow small snails or mice, toads, and frogs. The Blindworm is ovoviviparous, the eggs being hatched internally, and the young excluded alive. They are from seven to twelve or thirteen in number, and are produced in the vagina in the usual way. Mr. Swainson (Natural History of Fishes, Amphibians, and Reptiles, 1839) places the Anguidae under the order of serpents, between the Colubridae and the Aspidodermata, making the Anguidae consist of the genus Pseudechis, Ophidius, and Anguidae.

ORVIEO, ORVETO, a town of the Papal State and a bishop's see, in the province of Viterbo, is built on a steep hill 900 feet high, which rises above the river Paglia, an affluence of the Tiber; it is about sixteen miles north-east of Rome, and the town is detached from the calcareous ridge which divides the basins of the lake of Bolsena and the valley of the Tiber. The town contains 5,490 inhabitants. (Calzini, Saggio Statistico della Città di Orviotto, Rome, 1791.)

The chapel, dedicated to the Virgin Mary, is painted by Luca Signorelli, who has represented the Judgment, Hell, and Paradise, with a curious mixture of heathen mythology and Christian imagery. The other chapel, which contains the tombs of the bishops, has been 13 to 22 the building host at Bolsena, is very rich. [Bolsena.] The other remarkable
the elements of climate, and that moisture may be supplied to a plant either by the soil or the atmosphere, and the latter may be moist when the former is comparatively dry. Rice is sown in the Himalayas only in places within the influence of the periodical rains, that is, from about the middle of June to the end of September. In some places it is irrigated, and in others it is not, but rain falls very frequently, and the air is almost always in a moist state, from the being charged with moisture from the heated valleys which is deposited on the mountains, when it reaches an elevation where it becomes cooled beyond the point of saturation. The temperature also is so uniform as not to vary 10° of Fahr. from 70° to 80° in three months. Hence the mountain rice is cultivated only in the rainy season.

The rice so extensively cultivated throughout India (and the cultivation in China, as described by Sir G. Staunton, is very similar) depends upon rain or irrigation either from rivers or tanks. These Capt. B. Hall (Frag. of Plantag., vol. iii. p. 38) describes in one situation, near Nundydroog, as spread over a valley, which was from six to eight miles across, and that they were used for irrigating myriads of rice-fields. The embankments are sometimes miles in length, and then of a waving and askew shape. One valley was pointed out by Captain Hall, about a mile broad and forty miles long from end to end, which included between thirty and forty tanks, every intermediate space yard of the intermediate spaces being richly cultivated, while the surrounding country appeared to be continued to perennial sterility.

Dr. Roxburgh states that he never saw or heard of an Indian farmer manuring in the smallest degree a rice-field; yet these fields have probably for thousands of years continued to yield annually a large crop of rice, on an average, from thirty to sixty fold; even eighty or a hundred has been known. The best rice-fields are extensive open plains through which large rivers pass. The soil is generally of good depth; the best are those annually overflowed by the inundations from which they necessarily receive some fertilising matter; but the greatest part of the rice lands depend on the rains only, and receive no help except from it and the air. The varieties of rice are innumerable; forty or fifty at least are described. They are divided by Dr. Roxburgh into two kinds, cultivated in Teenmaar, Ponnas, Sant, Aroo, isown thick in June or July, and transplanted in about forty days, when the plants are about nine to eighteen inches high; the fields are then kept constantly wet; more or less flooded, as some sorts require very little water, while others require a great deal. When the grain is ripe, the water is drained off, and the crop cut down with the sickle: it is eitherstacked or trod out by cattle. The grain is preserved in pits dug in high ground and lined with the rice straw. The stack is stacked by the careful farmer for feeding his cattle during the hot weather.

The second division of cultivated rice is called Pedder Wortoo by the Telingas. The grains are small, and both the unhusked and husked rice, in most varieties, is white and of excellent quality, though some require much water. In other parts of the country rice is divided, according to the seasons in which it is reaped, into that which ripens in the hot weather of spring, in the summer, or in the winter.

Buchanan states that two crops in the year from the same land do not yield much more than a single good crop would. But the seasons are so uncertain, and the latter crop so liable to fail, that they cultivate as much as possible for the first crop. This is reaped in August, and the straw thereupon, being preserved, and as rice-straw is almost the only food which the cattle have in many districts, there is an absolute necessity for sowing the second crop for fodder. Rice is no doubt the grain which yields food for the largest portion of the human race, as the numbers which it feeds is incomparably greater than those of any other. So in the Inxs, Grain, and numbers do not eat rice; in fact in all the north-western provinces wheat is the principal crop, and the natives eat wheaten cakes, and have rather a contempt for rice-eating districts. It abounds however in nourishment, being composed of almost entirely of fecula, and per cent rice, and therefore cannot be baked into bread; but it is more easily cooked. It is light and wholesome, and easily digested, and might form a much larger portion of the diet in Europe than it does. Europeans in India eat it at breakfast as well as other meals, and with fish as frequently as with their armour.

Of the kinds imported into England, the Carolina is the best, and is grown in the marshy grounds of North and South Carolina. The grains are shorter, broader, and boil softer than the Patna rice, which is the best Indian kind known in this country, though in India there are several superior varieties, as for instance the P折射s, which are much more esteemed there. In the year 1838, 328,367 cwt. of cleaned and 214,297 cwt. of rough grain were imported into England. The quantity retained for consumption in the United Kingdom, in 1837, was 282,575 cwt.; in 1838, 289,063 cwt., producing a duty in the former year of 25,372, and in 1838, of 24,606. The consumption is in some measure influenced by the price of wheat. The relative values may be judged of by the price of the Carolina rice being 20s. when the Patna was 15s. Bengal white 13s. 6d., and the Cargo only 9s. 6d. The Cargo is a reddish coloured, coarse, but sweetish grain, which is liked by the lower caste of natives of India.

OSAIBIA, or more properly Ibn* Abi Osaibia, the name commonly given to an eminent Arabic physician, who is called by Nicolle and Pu-er (Catal. Cod. Manusers. Orient. Biblioth. Bod.); Movaffakedin Abulabass Ahmad Ben Alcasem Ben Kinliia Ben Junus Ibn Abulacem Alasadi Alhazardi. He was born A.H. 660 (A.D. 1263), and was the name of his family of the tribe of Al-Charraj of the tribe of Al-Azdi. (Pococke, Spec. Hist. Arab., p. 42, ed. Oxon., 1806.) He informs us, himself, in the fourteenth chapter of his work, that he was the pupil of the celebrated Al-Beithar. He studied medicine at Cairo in the lazzaretto founded by Saladin, and was appointed chief physician to the Emir Ezzadin, at Sarched in Syria, A.H. 635 (A.D. 1238). He died A.H. 668 (A.D. 1269). He is the author of a well-known work entitled 'Oum al-anba fi thabacel al-thebeba' (Fontes Religiosi de Chibchus Medecorum), containing a biographical history of medicine. It is divided into fifteen chapters, of which the first treat of the origin of medicine; the second, of the earliest discoverers in each branch of the profession; the third, of the Greek physicians of the family of Asklepius (Asclepius); the fourth, of the
Physicians of the school of Hippocrates (Ebrath); the 5th, of Galen (Galenus) and his contemporaries; the 6th, of the Christian physicians who flourished at Alexandria before the time of Mohammed; the seventh, of Arabian physicians in the time of Mohammed; the eighth, of Syrian physicians under the Abbasides; the ninth, of the translators of the Greek physicians into Arabic; the tenth, of the physicians of Ira and Mesopotamia; the eleventh, of the Persian physicians; the twelfth, of the Indian; the thirteenth, of the Egyptian; the fourteenth, of the Syrian; and the fifteenth, of the Syrian. Freind, in his 'History of Physic,' speaks slightly of this work, but he was acquainted with only a very small portion of it, and was unable to read it in the original language. Reiske, on the other hand, says: 'I have seen a copy of the Latin translation of this work, by Halm (1776), praises it very highly, and gives a tolerably complete analysis of its contents, from which it appears that a great many curious and interesting medical anecdotes and much information relating to the ancient method of practice are to be found in it. It exists at present only in MS. in several libraries of Europe, viz., at Paris, Oxford, and Leyden; but different small portions of it have been published. The 'Life of Bichitum, translated into Latin by Salomo Negro, is inserted by Freind in his 'History of Physic,' that of the 'Abdallama, translated into Latin by d. h. L. Molesley; and a small extract, containing the diploma of a doctor of theology, is to be found in Adler's 'Collect. Novar. Cummm.' 4to. Hafn., 1792, p. 118. There is no mention of these works in the Arabic words and phrases of the 'History of Physic,' by Gagnier of the first five chapters. A MS. Latin translation of the whole work by Reiske was left by him at his death, in 1774, to Bernard (probably the same physician who edited several Greek medical treatises); this has never been published. Campania and Sannitica. This performed, he continued to be understood at Rome down to a late period under the empire. (See Nicoli and Pusey, loco cit.; De Rossi, 'Dizion. Stor. degli Antichi Medici,' and Reiske, loco cit.)

Oscillations of the Ocean, and the Direction of the Waves. In the Social War, the Confederates, who were chiefly people of Italian descent, stamped Greek legends on their coins. In Campania and Sannitica, the use of Greek continued to be understood at Rome down to a late period under the empire. (Astellane Fabula.) In the Social War, the Confederates, who were chiefly people of Italian descent, stamped Greek legends on their coins. In Campania and Sannitica, the use of Greek continued to be understood at Rome down to a late period under the empire. (Astellane Fabula.) In the Social War, the Confederates, who were chiefly people of Italian descent, stamped Greek legends on their coins. In Campania and Sannitica, the use of Greek continued to be understood at Rome down to a late period under the empire. (Astellane Fabula.)

Concerning the seanty remains of the Ocean language which have come down to us, see 'Lingua Oceana Speculent singularum quod superest: Nolius in 'marmore Musei Seminarii,' which is given by Passeri, in his 'Picture Eurosorum in Vasculis,' &c., Rome, 3 vols. fol., 1767-75; and also the Speculum Oceani of the same author. For Niebuhr's views on the Oceani, see his 'Roman History,' vol. i.

Oscillation and Centre of Oscillation. When any system is slightly disturbed from its position of equilibrium, it either falls altogether or endeavours to recover the position which it lost. In the latter case the equilibrium is said to be stable, and in the former unstable. A pendulum hanging downwards is an instance of the stable kind, and the same pendulum, if it could be so nicely adjusted as to rest immediately over the pivot, would be of the unstable kind. But unstable equilibrium is a practical impossibility, since any degree of departure from the proper position would create the equilibrium. In cases in which an apparently unstable position of equilibrium is actually gained, as in a bar resting on two inclined planes, owe the continuance of the equilibrium to the effect of friction. (Stable and Unstable.)

When a system endeavouring to recover its position, it acquires some velocity in the process; so that, though it would rest at the position of equilibrium if that velocity were then destroyed, it is really urged through the position by the velocities which may be acquired as the system recoils from the other side until, by the forces which act to restore it to the position, all the velocity acquired has been destroyed. Repetitions of the same phenomenon then take place in succession, the body never remaining still when it has attained the position of equilibrium, since it never is in that position except when moving with the velocity acquired in its descent to the position. If then there were neither friction nor resistance of the air to help in destroying this...
velocity; it would be a universal law of mechanics that a
system disturbed from its position of equilibrium would
never recover it, but would make perpetual oscillations
about it.

In the widest sense, the problem of oscillations includes
most of those which occur in astronomy, optics, &c. The
moon and planets add to their average motions small oscil-
lations about their mean places; the tides consist of oscil-
lations of the ocean about the uniform spheroid, which, but
for the action of the heavenly bodies, would be carried
round in the diurnal rotation of the earth; the phenomena
of light are produced by the oscillations which take place
in an elastic aether; those of sound, by the oscillations of
the air; and so on.

Usually however the problem of oscilla-
tion refers to nothing more than the oscillations of a
solid system, acted on by gravity, about a horizontal axis,
the original departure from the position of equilibrium being
but small; in fact, to the purely theoretical part of the pro-
blem of the Pendulum, to which we shall here confine
ourselves, giving the investigations in a brief form, since it is
impossible, within our limits, to explain the numerous
points alluded to with sufficient illustration for a learner.

Let a material point, a very small body, be attached by a
string or rod without weight to an immovable pivot.
In the position of rest the string hangs vertically: let us now
suppose it removed out of the vertical position, and let go
when it makes an angle $\theta$ with the vertical. When $t$ se-
conds have elapsed, it makes an angle $\theta$ with the verti-
cal. The material point is acted on by gravity with a force
which would produce an acceleration $g$ ($32$ 1908) feet in
one second: if then $l$ be the length of the string, the arc $\theta$,
through which the point must move before it arrives at the
lowest point of its course, is diminished with a velocity
which is accelerated by $g \sin \theta$ at the time specified, by
the well-known equations of motion,

$$\frac{d^2\theta}{dt^2} = -g \sin \theta,$$

The first integration of this gives

$$l \left( \frac{d\theta}{dt} \right)^2 = 2g (\cos \theta - \cos \alpha),$$

since it is a condition that the motion began when $\theta$ was
$= \alpha$. This gives

$$\frac{d\theta}{dt} = -\sqrt{\frac{l}{g}} \sqrt{\sin(a^2 - \sin^2 \theta)}$$

$a'$ and $\theta'$ being the halves of $a$ and $\theta$, and the negative
sign being taken because $\theta'$ diminishes as $t$ increases.
The integration of this is facilitated by assuming $\sin \theta' = sin' \alpha' \sin \phi$, which

$$\sin(a' + \sin 2a') = \sin a' \cos \phi,$$

$\sin a' \cos \phi \sin \phi$,.

$$\sin'a' - \sin' \theta' = \sin \alpha' \sin \phi, \cos \phi, \sin \phi,.$$

$$dt = -\sqrt{\frac{l}{g}} \int \frac{d\phi}{\sqrt{1 - \sin^2 a' \sin' \phi}}$$

$$= -\sqrt{\frac{l}{g}} \left[ F^1 + \frac{1.3}{2.4} F^2 + \frac{1.3.5}{2.4.6} F^3 + \ldots \right] d\phi$$

where $F$ stands for $\sin a' \sin \phi$. To find the time of a semi-

$$vibration, this must be integrated from $\theta' = a' \theta' = 0$, or

from $\phi = \frac{1}{2} \pi \approx \phi = 0$, that is, after change of sign, from

$\phi = 0$ to $\phi = \frac{1}{2} \pi$. Now between these limits

$$\theta = \frac{1}{2} \pi \sin a' \sin \phi,$$

$2.4.6 \ldots \frac{2m}{\pi}$

whence, changing the sign of the preceding and integrating
each term by this formula, we find the time of a semi-
vibration:

Double this, to find the time of a vibration, which
call $T$, and we have

$$T = \sqrt{\frac{l}{g}} \left\{ \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \ldots}} \sin' \alpha' + \ldots} + \frac{1.3.5}{2.4.6} \sin a' + \ldots \right\},$$

a very convergent series. If $a'$ be small, we have, with
an error of the second order only,

$$T = \sqrt{\frac{l}{g}} \frac{1}{1 - \frac{1}{16} a'^2}.$$

The number of vibrations in a mean solar day of the pen-
dulum whose length is $l$, placed in a vacuum, is

$$v = \frac{86400 \sqrt{g}}{\pi l} \left(1 - \frac{1}{16} a'^2 \right)$$

very nearly.

Next, let a number of material points invariently connected
together vibrate about a horizontal axis. It is required to
find at what distance a single material point must be hung
that it may perform the same number of vibrations in the
same time.

Let there be a number of material points, or infinitely
small bodies, having the masses $m$, $m'$, $m''$, &c., invari-
ably connected with each other, and with an horizontal axis
of rotation, their perpendicular distances from the axis
being $l$, $l'$, $l''$, &c., $M = m + m' + m'' + \ldots$, &c., all of the
masses, and let $k$ be the perpendicular distance of the
centre of gravity of the whole from the axis. The

When the last-mentioned perpendicular distance makes an angle $\theta$ with the vertical, the moving force is $Mg$ acting in
the direction of gravity at the distance $k \sin \theta$, and acting with a moment of rotation $Mg \sin \theta$. Let $\phi$ be the angular velocity at the time in question, which becomes $\phi + \frac{d\phi}{dt}$ at the end of a new interval $dt$; then taking the mass $m$ for
consideration, we have $\frac{d\phi}{dt}$ for its actual rate of velocity, and $l\phi$ for the increment in the time of $l$, whence $l\phi \frac{d\phi}{dt}$ is the actual momentum gained, $l \frac{d\phi}{dt}$ the moving force which would
produce that momentum. This force acting at the distance
$l$, and perpendicularly to that distance, would exert a moment of rotation $l \frac{d\phi}{dt}$. Ascertain in the same way the
moments of rotation of the other masses; then by the

The question of the motion of this system is now
completely reduced to that of a simple pendulum; for if we

where $M$ stands for the mass of the whole system and $F$ for
the centre of gravity. If in the line $l$ or its continuation,
a distance equal to $2m \times l$ : $M$ be set off from the axis,
the moving extremity is called the centre of oscillation, as being
that point of which the whole system revolves without any alteration of the law of oscillation.

Let $G$ be the point of inertia when the axis passes
through the centre of gravity and is parallel to the
given axis; then $[\text{MOMENT OF INERTIA}] = G m + G M^2$, whereas
$M$ is the mass of the whole system, and $G$ the

$$h_k = G \left( \frac{M}{M} \right)$$

Now G and M are independent of the position of the
axis, G depending only on the masses and manner in
which the system is divided. G would be the same if the
system were divided in any manner, and M on the amount of the masses. If then a new axis of suspension
were taken distant by $\delta$ from the centre of gravity in
the other side, that is, if a new axis of suspension was taken passing through the first centre of oscilla-

For the sake of simplicity, the motion of the point
$M$ will be considered as being one of simple oscillation
about $G$; the motion of any other point may then be
determined by the rule,

$$x = \sin \theta, \quad v = \cos \theta \frac{d\theta}{dt}, \quad a = \cos \theta \frac{d^2\theta}{dt^2}.$$

The acceleration is expressed in terms of the gravity
at the point, and the initial direction of the oscillation.

For the sake of simplicity, let the pendulum
be supposed to be massless, and the period of oscillation
be $l \theta$. Then we have

$$T = \sqrt{\frac{l}{g}} \frac{1}{1 - \frac{1}{16} a'^2}.$$
ment by Herodotus, that Osiris was the origin of the mummy form.*

Both ancient and modern writers have differed considerably respecting the peculiar attributes and powers of this deity. Many of the antiquaries believe that he represented the sun or the Nile; while his discovery of the vine and his expedition to India led others to identify him with Dionysus.

(HEROD., i. 44.) Herodotus informs us (ii. 48) that the festival of Osiris was celebrated in almost the same manner as that of Dionysus. It appears however not improbable that the worship of Osiris was introduced into Egypt, in common with the arts and sciences, from the Ethiopian Meroe. We learn from Herodotus (ii. 29) that Zeus (Ammon) and Dionysus (Osiris) were the national deities of Meroe; and we are told by Diodorus (iii. 9) that Osiris led a colony from Ethiopia into Egypt.

Osiris was venerated under the form of the sacred bulls Apis and Mnevis (Diod. i. 21); and as it is usual in the Egyptian symbolism to employ the image of their deities with the best forms and with the heavens of the animals. At which time their representatives, we find statues of Osiris represented with the horns of a bull. (EGYPTIAN ANTIQUITIES, vol. ii. p. 295, 12mo, 1836.)

Osiris, in common with Isis, presided over the world below; and it is not uncommon to find him represented on rolls of papyrus as sitting in judgment on departed spirits. His usual attributes are the high cap, the flail or whip, and the crosier. He is also frequently represented with an animal head.

OSMAZOME. A name given by Théodr., and adopted by most chemists, to a spirituous extract of meat; according however to Berzelius it is not a peculiar substance, but a mixture of several different bodies, among which are lactic acid and lactones, which on the opinion of the chemists, are not altogether to be abandoned. According to the experiments of Chevreul however osmazone contains a peculiar substance, to which he has given the name of creatin (from spic., flesh).

Creatin is solid, inodorous, insipid, colourless, and has a pearly lustre; it does not act upon test papers, and crystallizes in right prisms. Its specific gravity varies from 1.39 to 1.84. When heated it cracks, loses water at 215°, and melts without being discoloured; but on continuing the heat it decomposes, yielding acetic acid and excess of water. In 100 parts of water dissolve about 12 parts; this solution is scarcely at all acted upon by saline or metallic substances. The solution slowly decomposes, exhalating a distinct ammoniacal odour and becoming turbid. Alcohol and most acids also dissolve it.

OSMUM. This metal was discovered by Mr. Smithson Tennant, in the year 1803, in the grains of native platinum (platinum), along with another metal (iridium). This compound, called a compound of platinum and iridium, forms long, slender, and hexagonal crystals. The primary form is a rhomboid. Cleavages perpendicular to the axis. Hardness 4.5 to 5., exceeding that of native platinum. Colour iron-grey and pale steel-grey. Lustre metallic. Opaque. Specific gravity 19.3. It occurs in large, flat grains and is readily oxidized. Potion and in aqua regia; becomes black when fused with nitre, and when heated in a tube exhalates a peculiar odour.

Berzelius analyzed three varieties of osmiridium from Siberia, with the annexed results:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Osmium</th>
<th>Iridium</th>
<th>Rhodium</th>
<th>Iron</th>
<th>Palladium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>80</td>
<td>20</td>
<td>25.1</td>
<td>0.74</td>
<td>trace</td>
</tr>
</tbody>
</table>

The separation of osmium from iridium is effected by a tedious process. This metal has the following properties:

It is a white, silvery, and bluish tint. It may be reduced to leaves. Its specific gravity is 10. It is unalterable in the air at common temperatures, but if strongly heated it oxidizes. When it has been exposed to a very high temperature, it dissolves completely. It is always bluish black in aqua regia and is readily oxidized. In both cases osmic acid is formed.

Protopodie of Osmium.—When potash is added to a solu-

* Herodotus says (ii. 65). "the most elaborate (mummy) style belongs to him who makes 1; and not 1, 5, or 10 on such an occasion." There is no doubt that he means Osiris. Compare ii. 70.

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tion of chloride of osmium, the protoxide is precipitated in the state of hydrate, and is of so dark a green colour as to resemble verdigris. This hydrate, however, involves slowly in acids, forming dark green coloured solutions; these do not yield crystals by evaporation, but leave green or greenish-brown translucent residues. When the hydrate is heated rather below redness, it loses water. It detonates when heated in vacuo, but it is stable in moist air.

It is composed of 1 equivalent of oxygen $8 + 1$ equivalent of osmium $100 = 108$.

Sesquioxide of Os is not procured in a separate state, but is obtained in combination with ammonia when the binoxide is distilled over a mixture of the two. In this state it exists as a white powder or as a white mass of the solid substance. It is a compound of 2 equivalents of oxygen $16 + 1$ equivalent of osmium $100 = 116$.

Tetroxide of Os is prepared from the terchloride in the same way as the binoxide from the bichloride. Its existence however is not perfectly established, but is admitted by Berzelius from analogy. If it exists it is composed of 3 equivalents of oxygen $24 + 1$ equivalent of osmium $100 = 124$.

Peroxide of Os, or Oxide Acid. — This is a very curium powder, differing remarkably from all the preceding substances. It is white, and whenever it is exposed to air in oxygen gas, or when the metal is heated with nitric acid. It is white, very volatile, extremely fusible, soluble in water, and crystallizable. It possesses an extremely disagreeable odour, somewhat resembling that of chlorine. The property is suggested by the name of the metal (tor, odor). It has no acid reaction, except that of combining with alkalis, forming compounds which are called osmates. When sulphurous acid is added to a solution of osmic acid, it is rendered yellow, orange, brown, green, and blue, with the addition of a brown powder which on evaporation is oxidised and remains. It stains the skin, is acid and poisonous. It is composed of 4 equivalents of oxygen $32 + 1$ equivalent of osmium $100 = 132$.

Chlorine and osmium, according to Berzelius, combine in four parts proportions, and sulphur and osmium also unite to form several sulphuric acids. This very peculiar metal also forms alloys with some others, but these compounds are not of sufficient importance to require a description.

**OSNABRÜCK.** (generally written Osnabrück in English) is a province of the kingdom of Hanover. It is divided into three counties: —

1. The county of Osnabrück, 90½ square miles; the lower county of Lingen, 126½ square miles; the circles of Meppen and Ensionhèren, 693 square miles; and the county of Bentheim, 399 square miles; the area of the whole is 212½ square miles, and the population 227,000.

The main town is the capital of the province of northern Germany, but it is traversed in the south by two chains of hills; within and to the south of these hills there is good arable land, but as soon as you leave their vicinity everything is changed. Immense heaths, moors, morasses, and sandy deserts alternate with vast levels; except near the rivers, the soil is poor and the vegetation scanty.

This province contains the Hümuling, an extensive unirrupted sandy desert, which is 25 miles in circumference, and is a part of the great sandy desert of Egypt, and which is entirely surrounded by vast and impenetrable morasses: it is beyond comparison the most dismal tract in all Germany. The largest river is the Ems, which waters only the western part, and becomes mixed with the Rhine by the house, the second principal river; all the other streams are mere rivulets or brooks. In the south there are many good springs; in the north they are fewer and have more or less a miliary taste. The climate is temperate, but the horizon is generally overcast and clouded. It is subject to occasional storms of the most violent kind, but do not seem to be injurious to health, for human life is as long here as elsewhere, and the cattle are remarkable for their size and beauty. Agriculture is not in a flourishing state, and the country does not produce sufficient corn for own consumption. Hemp and flax are grown in considerable quantity. There is only one principal manufacturer, that of linens, which is carried on to a very great extent, especially in the neighbourhoods of Osnabrück and in Lingen.

Though considered as an occasional occupation, it is more profitable than agriculture. The value of the coarse linens (called Osnabrücker) annually exported is 200,000 dollars. The thread is all spun in the country. In the circle of Meppen, which is the poorest part of the country, there is a considerable number of dyers who support the trade by the employment of very industrious and temperate people, vast quantities of woollen stockings, are knitted and exported to Holland. They also derive some profit from the breeding of horned cattle, sheep, and bees. They export also a good deal of turf and meal. The greater part of the men of Meppen (4000 or 6000 perhaps) go in summer to find work in Holland, from which they annually bring back 18,000 or 20,000 pounds sterling.

There are some woolen, leather, and snuff and tobacco manufactories in the large towns, and shipbuilding is carried on at Papenburg, where above sixty ships are annually built.

Osnabrück was formerly a bishopric and of very great antiquity, being the first that was founded in Saxony by Charlemagne. The first bishop was Wido, a Frankish. After the Reformation the bishops embraced the Lutheran faith, and it was decided by the treaty of Westphalia that it should be governed alternately by a Roman Catholic and a Protestant bishop. The latter was to have the greater influence, and it was arranged that the Roman Catholic bishop was generally an old canon and the Protestants always chose a young prince, and the country remained for a long time under the electoral house of Brunswick: the last bishop of that house was the late Duke of York. In 1801 the See was suppressed, and the territory became a hereditary temporal principality, in consideration of certain territorial cessions. It was afterwards annexed first to the kingdom of Westphalia and then to the French empire, and was recovered by its ancient sovereign on the fall of Napoleon.

Osnabrück, the capital, is situated in 52° 16' N. lat. and 8° 1" E. long., in a valley on the river Hase. It is surrounded with a wall and ditch, and has five gates. Like most of the old German towns, it is irregularly built. It is a part of the ancient duchy of Saxony, and the residence of a Roman Catholic vicar general and chapter, and of a Lutheran consistory. The most remarkable public buildings are: the palace, built in 1663, the cathedral, the Roman Catholic church of St. John, the Lutheran churches of St. Mary and St. Catherine, and the fine town-hall, in which the treaty of Westphalia was concluded at the same time as at Münster. There are a Catholic and a Lutheran gymnasia, a Lutheran, and 2 Roman Catholic orphanages, a seminary for schoolmasters, 5 hospitals, several dispensatories, a society for the relief of the poor, and a Bible society. The inhabitants, amounting to 11,000, have manufactories of coarse woollens, leather, linen, and tobacco. The linen manufactured in the adjacent country is brought here to be measured and stamped. There are several brickworks and foundries, and the paper mill of the diocesan property, &c.

(Hassel; Stein; Stüwe, Besch. des Fürstenthums Os n a b r ü c h ; J. Moser, Osnabruck; Geschicht; Reinholt, Die Bischofszeit Osnabrück.)

**OSPREY.** [BIRD BIZARD].

**OSROÈNE.** [MESOPOTAMIA].

**OSSA, MOUNT.** [THASSALY].

**OSSOLA.** [NOVARA, VALLI DI].

**OSSEOUS BREECHA.** A considerable number of the bones of the mammoth have been discovered in some caves which have been found in clefts of limestone rocks, wholly or partially filled by a mingled mass of calcareous fragments and portions of bones, more or less perfectly cemented by carbonate of lime, often in a crystallized state. This bony breecha abounds in the chief cave of the cave of the other parts of the Mediterranean shores; and in Cuvier's magnificent work 'Onsemous Fossiles' a large number of interesting quadrupeds and some birds are stated to have been obtained from it.

**OSSIAN'S POEMS.** In the article MACPHERSON the circumstances connected with the publication of these poems, and of others which preceded them, are briefly mentioned. Macpherson affirmed that they were translations made by himself from ancient Scoto manuscripts, which he had collected in the Highlands of Scotland, and which were the genuine compositions of Ossian, a Highland poet, who lived about the middle of the third century, and
whose poetical works had been transmitted orally from bard to bard and from age to age, till the introduction of the art of writing into the Highlands afforded the means of fixing them in those manuscripts from which the translations were made.

The truth of this statement was denied by Dr. Johnson, who boldly pronounced the whole of the poems ascribed to Ossian to be forgeries, and defied Macpherson to produce a manuscript of any Erse poem of earlier date than the sixteenth century. Hume, Gibbon, and others, though they did not agree in the conclusion which Macpherson had arrived at, did not doubt their authenticity. On the other side, Dr. Blair defended them in an elaborate "Critical Dissertation;" Dr. Henry, in his "History of Great Britain," founded many of his statements relating to the early condition and manners of the Inhabitants of the Island especially, upon their authority; Lord Kames, in his "Sketches of Man," appealed to them as substantiating his theories; Cesaretti annexed to his Italian translation, which improved their beauties and softened their defects, a dissertation in which he speaks of Ossian as equal if not superior to Homer; Arthur Young lent his aid on the same side; and the whole body of the Highlanders seemed ready to do battle in the cause of the Gaelic bard.

The Edinburgh Review, added to the 2nd volume of the first edition of his "History of Scotland" a dissertation in which he endeavoured to establish, from historical and internal evidence, that the "Poems of Ossian" were, without a single exception, entirely spurious.

The article by Macpherson, in 1797, appointed a Committee to inquire into the authenticity of the "Poems of Ossian." A list of queries was sent to every person who was likely to afford information on the subject, antient Erse and Irish manuscripts were assiduously sought after, and all the new results existing in an Highland language, which had any relation to the subjects of the poems were carefully collected. In 1805, when the Committee had completed their labours, they published their Report, with the name of Henry MacKenzie annexed to it as their chairman. The Report states, that there is not the slightest probability of the poems of Ossian being the same in title and tenor with the Poems of Ossian. About the same time was published a splendid edition of "The Poems of Ossian," &c., containing the Poetic Works of James Macpherson, Esq., in Prose and Rhyme; with Notes and Illustrations by Malcolm Mackay. The object of these notes and illustrations was to destroy the authority and depreciate the value of the text.

The research, the acuteness, and the close reasoning of Laing, both in his dissertation and in the notes to his edition of the poems, have, in consequence of his unparalleled labours, added new life to the Ossianic literature, which, as a whole, has been gradually revived by the publication of the "Quarto of the Orison, History and Antiquities," by F. Skene, a work published in 1837, at the request of the Highland Society of London, we are informed, that "by a face altogether singular in the case of the Highlanders, a complete body of these antient versified histories have been handed down in the Poems of Ossian" (vol. i. p. 206); and that "the value of Ossian, as an historical poet, must stand in the highest rank, while, whether the chief part of these poems are of antient or of modern composition, the interest of the literature of the Highlanders is not likely to be diminished by the latest results which Macpherson has brought to light. Thus do we perceive the oldest record of the history of a very remote age" (vol. i. p. 215).

Having thus given a short detail of the nature, progress, and present state of the controversy relating to these poems, we shall now, as the result of our investigation, venture to state our opinion upon the most important facts and arguments which bear upon their authenticity, and, secondly, our own estimate of their poetical value.

Of the languages spoken by the Gaelic nations who inhabited the north-west and west coast of the British Islands in the time of Julius Caesar, the Irish is probably that which has suffered least by mixture with others. The Erse, spoken in the Highlands of Scotland, approaches so closely to the Irish, that it may be considered rather as a dialect of it than a distinct language. There is, however, a difficulty of language and custom arising from an era probably anterior to the Christian, with an antient alphabet, and a series, not of bards, but of historical annalists, of whose works there are manuscripts still extant of an early date as the ninth century, there is no evidence that the Erse was ever written previous to the fifteenth or sixteenth century. If these poems were composed by Ossian, in Erse, at the end of the fourth century, they must have been preserved by tradition for thirteen or fourteen hundred years. The Irish, with all the advantage of writing to hand, have suffered so much alteration that the oldest manuscripts are understood with difficulty even by those who are most learned in the language, and some are quite unintelligible. We have therefore a right to infer that the Erse, unwritten, and spoken by a people at least as rude as the Irish, was a still more difficult language to preserve. Hence these poems, if preserved in the words in which they were composed by their supposed author, could not be understood by the present race of Highlanders.

Macpherson published the Erse of the seventh book of Themoera, but it was printed from a copy in his own handwriting, and the original has never been produced. Macpherson of Strathmashie, a poet who assisted, as he affirms, in transcribing the poems from old manuscripts or from oral tradition, said that one of these old manuscripts was dated 1410; and Lord Kames in his "Sketches of Man," asserts, that the four first books of Fingal were obtained from a Gaelic manuscript, written on vellum in 1403, and found by the translator in the Isle of Skye. No doubt was expressed by him, but he does not say that he saw the manuscript nor that it had been in the possession of the oldest Scotch MS. extant, a copy of Winton's Chronicle, in the Royal Library, Edinburgh, is not of an earlier date than 1420. As to the Erse manuscripts, frequent appeals were made by the translator to the "greatest bard of the Clanranald family, which was in Macpherson's possession, and was said to contain some of the poems which are now translated and published." It was obtained from him, but not till he was actually threatened with a suit for calumny by the Clanranald family. And the poet, in his "Sketches of Man," adds, that the first two books of Fingal were translated from a Gaelic manuscript, written on vellum in 1403, and found by the translator in the Isle of Skye. No doubt was expressed by him, but he does not say that he saw the manuscript, nor that it had been in the possession of the oldest Scotch MS. extant, a copy of Winton's Chronicle, in the Royal Library, Edinburgh. This makes it certain that the poems were composed by Ossian, and that the translations are accurate and copious. It is therefore certain that the poems were composed by Ossian, and that the translations are accurate and copious. It is therefore certain that the poems were composed by Ossian, and that the translations are accurate and copious.
in the Dublin University Library, several of which were published by Miss Brooke in 1759 with an English poetical version; and there are traditions, not only in Ireland, but also in Scotland, especially in Argyllshire and other districts in the Western Highlands, relating to Fingal, Osian, &c. Some of these ballads and traditions have supplied circumstances, or names, or incidental allusions, which have been worked up into the Osianic collection; so that the Highland reader was continually reminded of something with which he was familiar in hisimagining. He thought of certain parts which he thought he knew, was ready to claim the whole. These materials have been carefully compared, both by Lang and the Highland Society, with the poems, and the use which has been made of them in each instance separately pointed out.

According to Osian's Poems, Fingal was king of Morven, which may be supposed to represent Argyllshire and the adjoining parts of the West Highlands; here he had his palace of Selim (a name never heard before the Fingalisation of Osian's Poems), and here his father Comhal, his grand-father Trathal, and his great-grandfather Tremorr reigned. Osian was the son of Fingal, and Oscar the son of Osian. For this kingdom and its kings there is absolutely no foundation in the annals of the Highlands; however Highland traditions Fingal and Osian are occasionally spoken of as Highland heroes, but in others they are mentioned as Irish. On the contrary, the Irish annalists and the Irish bards are ununiform and distinctly notice these persons. According to the Irish annalists, Fingal, son-in-law of Cormac, king of Leinster, was commander of the Fianna Erin, or Fiains, a military race who existed at this time in Ireland. Fingal's palace was at Almhuin, or Allen, in Leinster, and his capital was at Carber, referred to in the earlier part of the Osian. "The son and successor of Cormac, this mortal, or militia as they have been called, were put down by force in consequence of their dangerous presumption and the dissensions among their own body..." They were attacked," says Moore (p. 15), "by the united force of almost all the royal troops of the kingdom (the king of Munster alone taking part with the rebellious Fiains), and a battle, memorable for its extent of carnage, ensued, in which Osgar, the son of Osian, or of Fingal, was slain. The men of Ireland were also driven away. Hence the battle of Gabbra, which forms the groundwork of the poem of Temora.

At this time, and for some centuries afterwards, the name of Scotland was exclusively applied to Ireland, and the name of the inhabitants who had conquered the greater part of Ireland, and gradually imposed their name on the island and its inhabitants. One of this race, Carber Ruada, in the year 258, led over a colony of the Scoti from Ireland, and established them on the ancient lands of the Hibernians. This was named Dalriada, and the district obtained by his colony was called Dalriada also. They had great difficulty however in maintaining their station against the power of their opponents the Ficts, and it is uncertain whether they were not driven back by the Britons, and their country was led over by Fergus MacEorth, who established the kingdom of Dalriada, which afterwards obtained possession of the whole of the northern part of Britain, and imposed the name of Scotland on the inhabitants, and of Scotland on the country, as had previously been done in Ireland. The Highlanders became connected with the Scots of Ireland, and through them derived their traditions of Fingal and Osian.

It is not worth while to enter into evidences of forgery afforded by single circumstances and minor details in the various poems. Such evidences are in fact diffused through the whole of them, and meet us at every step, either in sentiments inconsistent with the rude state of society at the time, or in the absence of every allusion to the addresses, the means of subsistence, and the superstitions of the inhabitants, as well as all mention, even incidentally, of animals which are known to have been in the country at the time. Such omissions could hardly have been made by a poet who was familiar with the manners and objects of that age, and was himself a party in the events which he describes.

To show the modern materials and workmanship of the poems, Lang has pointed out, in numerous passages, imitations of the Bible, and of Homer, Virgil, Milton, and others. Many of these imitations are obvious enough, but others are more casual resemblances of phrases and words, which a genuine translator might have easily fallen into in rendering a real original.

The substance of Dr. Blair's "Critical Dissertation on the Poems of Osian," was originally delivered, soon after the first publication of "Fingal," in the course of his lectures as professor of rhetoric and belles-lettres in the university of Edinburgh. This Critical Dissertation, an elaborate composition of nearly pure nonsense, which expresses unutterable astonishment that such poems should have been produced by a Gaelic bard in the third century, extended the same astonishment not only throughout Great Britain, but over the whole continent of Europe; and France, Germany, and Italy vied with each other in enthusiastic admiration of them. This fever has in a great measure subsided, but Osian has lost his admirers, and the Dissertation, no doubt, renders. To us it appears that almost everything which gives intrinsic value to other poems is wanting in these. We read them with almost uninterrupted incredulity. The characters represent a race of men which it is an absurdity to suppose to have existed in the third century, and in almost every part so far as they are intelligible and there is anything approaching to detail, are such as we cannot even imagine to have occurred at any time or under any circumstances. All good poetry is distinguished by the truth and distinctness of the poem from its content, and our greatest poets that they must have looked upon external nature and watched the workings of the human mind with the greatest diligence; and this appearance of truth is preserved not only in such poetry as represents the actual appearance of events, but even in that more elevated poetry which passes beyond the bounds of reality. In Homer, with whom Osian has been so absurdly compared, the scenes are perfectly panoramic; we never imagine that we are looking at a picture; the objects move before us as if they were actually present, and all the persons are known to us, with all their peculiarities, and we can trace their motives of action; when they express themselves in such or such a way, we can tell what passion is at work within them, and express ourselves in the same way, and a wearisome repetition of affected sentimentality pervades the whole.

Without something however of the substance of poetry, so high a reputation as these poems once had could hardly have been acquired. The school of Macpherson, and the whole school of the Irish School, or of the Osian School, with its direct imitation, has been founded on the same principle, and is based on the same sort of talent and character. We are informed indeed that some are old and some are young, some are generous and some cruel, but even these personal distinctions we should hardly have discovered from any peculiarity in their thoughts or expressions; from the sentiments or the objects of the poetry we infer them, and therefore it is not an accident of some men are good and some men are bad, and there is a set of characters in this poetry which are not intended to have any other meaning than what they appear to have.
ossification is the formation of bone. The natural process is already considered in the article bone, and that by which injuries are healed in the article fracture. Unnatural ossification is observed in several tissues of the body, and not particularly confined to the epiphysial cartilages, in which it almost constantly occurs in advancing years. In most persons bone begins to form in these parts after the fifth year; it sometimes commences between the ages of thirty and forty, but is often delayed to a much later period; and Harvey and La Motte have both described instances in which it had not commenced at the age of eighty. In 1536th year, the cartilages of the ribs were still poor and soft. The change is generally earlier in men than in women, and it affects the cartilage of the first rib sooner.

Next to the cartilages of the ribs those of the windpipe are most liable to become ossified. Ossification of the cartilages of the ear, nose, and Eustachian tube is, on the contrary, extremely rare, and in the few cases in which it occurs, the ossification is of the loosest and oldest age. The cartilages of the movable joints never ossify.

The tendinous tissue is that which, next to the cartilaginous, is most subject to ossification. This change is not uncommon at the insertion of the tendons of muscles that are not exercised, and in cases of some of the movable joints. Small pieces of bone are also not unfrequently found in the dura mater, and are one of the sources of inconstant epilepsy. Bone is also sometimes formed in the fibrous coats of the spleen and liver.

Ossification occasionally takes place in the false membranes produced by acute inflammation of the pleura, and more rarely in those of the pericardium; and it is a common process in the adhesions which form between the heads of the toes. For the sake of the microscopist it is important that the most fixed kind of ankylosis of the joints.

A few remarkable cases are recorded of ossification of the muscles. There is a skeleton in the museum of the College of Surgeons in London, in which it has taken place to such an extent that the leg is entirely changed into bone, and movably fixed by the transformation of the tissues by which, in the healthy state, they are moved. In equally rare cases the crystalline lens, the vitreous humour [BYK], and some other parts, are found converted into bone.

In all these instances the material formed exactly resembles true bone in its minute structure and chemical composition. In other cases, in ossification of the heart and arteries, the substance deposited is composed of carbonate and phosphate of lime, as bone is, but its particles have no definite arrangement. That which is called ossification of the heart is not an affection of the proper substance of that organ, but of its valves, in which earthy matter is sometimes deposited, so as to render them stiff and unyielding, and decrease the power of their functions. A deposition of earthy matter in any part of the substance of the heart itself is among the rarest diseases, but such cases are on record. [HEART, DISEASES OF.

The disease named ossification of the arteries consists in the deposition of plates or rings of hard earthy substance in their middle elastic coats. This deposition is preceded by that of a peculiar soft opaque yellow substance, which becomes gradually hardened. The deposition of this yellow substance in the large arteries is so common that it is very rare to meet with the body of an adult in whom it has not taken place to a greater or less extent; and it not unfrequently commences in early childhood. The change to earthy matter does not commonly take place before the thirteenth year, and is very general after the sixteenth.

The ulceration of their lining membranes which often accompanies it, and the dilatation consequent on their loss of elasticity, are common causes of dyspepsia and dropsy. The same changes are frequent in the arteries of the neck, and the obstruction to the circulation which they produce generally gives rise, if life is sufficiently prolonged, to the affection called gangrena senilis. [ARTERIES, DISEASES OF.

Ossory, an Irish bishopric, included in the ecclesiastical province of Armagh. The diocese is bounded on the north by that of Kildare, on the northeast and east by that of Leighlin, on the south-east by that of Ferns, on the south by that of Waterford, on the south-west by that of Lismore, on the west by that of Cashel, and on the north-west by that of Raphoe. It is a small and hilly county, detached from the main part, and is surrounded on the north by the bishopric of Meath, and on all other sides by that of Killala. The extreme length of the diocese of Ossory from north to south is given by Dr. Beaufort (Memoir of a Description of Ireland, 1830) as 36 Irish or 46 English miles; the breadth at 23 Irish or 29 English miles; and the area, by Dr. Beaufort, at 346,000 Irish or 553,869 English acres. By taking the length in the direction from north-northwest to south-southeast, the length is 36 Irish or 46 English miles, and the breadth 17 Irish or 22 English miles. The diocese comprehends nearly the whole county of Kilkenny, a good part of Queen's County, and a small portion of King's County. It takes its name from a district, not from a town.

The bishopric was founded early in the fifth century, and was established in the first instance at Saighir, now Seikyran or St. Kyran, a parish which forms the detached part of the diocese of Ossory. In the eleventh century (A.D. 1052) it was moved (A.D. 1052) to Agabheo or Aghaboe, in the barony of Upper Osory in Queen's County, and finally (near the close of the twelfth century) to the borough of Itrahtown, which forms part of the city of Kilkenny. The cathedral, of which the site is at St. Canice's, was greatly enlarged in the twelfth and thirteenth centuries. It is in the form of a cross, chiefly of early English architecture, with a low massive tower at the intersection of the nave and transepts.

KILKENNY, CITY OF. The cathedral establishment comprises a dean, a sub-dean, the four chantries of S张, deacon, seven prebendaries, and three vicars choral. The bishop has a good house close to the cathedral.

The gross yearly income of the bishopric, on the average of three years ending 1891, was 35056£. 6s. 4d. The net income, the amount which is left for the endowment of the diocese, is 1166£. 16s. 4d. Average, to the see comprise 21,730 statute acres of profitable land. The bishop presents to the dignities and prebends in the cathedral, and to twenty-two other benefices. The number of parishes in the diocese was given by Dr. Beaufort (A.D. 1830) as 13,1; the number of benefices at 56; of churches at 36; and of glebe-houses 12. By the Fourth Report of the Ecclesiastical Commissioners (Papul. Papers for 1837, vol. xii.) the number of parishes was given at 128, the number of benefices at 59; 39 owned by the bishopric, and 20 parishes and 27 unions. Of the 59 benefices, only 46 had churches; there were three chapels-of-ease: making 49 places of worship of the establishment, capable of accommodating 9170 persons. The population of the diocese in 1834 was estimated by the Commissioners of Public Instruction at 222,325; viz. 12,361 members of the established church, 209,848 Catholics, 8 Presbyterians, and 108 other Protestant dissenters. The number of places of worship by the First Report of the Commissioners (Papul. Papers for 1835, vol. xxi.) was given at 190, the number of churches was 94, for Catholics, and 4 for Protestant dissenters. The Presbyterians had no meeting-house in the diocese. The number of benefices as well as of churches slightly varies in this Report from that quoted above. The proportion of the members of the establishment in the population of the whole of Ireland; that of the Catholics materially above the average; that of Presbyterians and other Protestant dissenters very much below the average.

The number of day-schools in the diocese, according to the Second Report of the Commissioners of Public Instruction (Papul. Papers for 1835, vol. xxi.) was 398; of which 290 were wholly supported by payments from the parents of the children, and 58 wholly or in part by endowment, viz. 15 in connexion with the National Board of Education. The total number of children at
school was computed at 26,976; of 18,688 children contained in the schools from which returns were made, 11,449 were boys, 7198 girls, and of 221 the sex was not specified. The computed proportion of children at school to the total population was 9.44 per cent., being considerably above the average of Ireland.

This see has been united, by virtue of the Act 3 & 4 Will. IV, to the adjacent sees of Lichfield and Ferns.

The sun-sea,比赛, S. Isaac Van, born at Liége in 1610, in the city of Liége; but though a German by birth, he is always considered to belong to the Dutch school, having formed his style in Holland, where he studied under Frank Hals, and is said to have received some instruction from Rembrandt. He is found bound to Frank Hals and in the acquaintance with Brouwer, who became his intimate friend and adviser. Like Brouwer, he chose his subjects from life, such as farm-houses, stable- and the interior of allehouses; the figures are generally occupied in drinking, smoking, and the like; rural sports, village weddings, and countrywomen engaged in their domestic employments, were the scenes and the characters with which he was familiar. But though in the choice of his subjects he had no regard to elegance, and though he took what he had before him without any attempt to diversify the habitations of his compositions, his subjects are there, as such, the true nature, and life in his little pictures, there is such delicacy in his pencil, such warmth, transparency, and brilliancy in his colouring, and such a perfect knowledge of the air, that it is impossible to admire his genius and execution. The following is the character given of him by Fussel:

"Adrian van Ostade, more properly than any other Dutch, Flemish, or German artist, may be said to have raised flowers from the earth itself. He has created for himself the line which just differentiates the animal from the brute, and stamps his actors with instinct rather than with passions. He has personified the dregs of vulgarity, without recommending them by the most evanescent feature of taste, and yet the sight of him is not disagreeable to the judgment of those who, beguiled our eye to dwell on the lascivious imitates and contents, and surprises our judgment into implicit admiration, by a truth of character, an energy of effect, a breadth and geniality of touch and finish, which leave no need for country. The style in which he is least bad. Teniers, he is far more vigorous and gleaning; if his forms be more squat and brutal, they are less fantastic and more natural; if he groups with less amenity, he far excels the Flemings in depth and real composition.

I am not so well acquainted with his works as to state the time in which he was most frequented. He was very much so by the most eminent contemporary artists to paint the figures in their landscapes. His best works are extremely scarce and sell at very high prices. Dr. Waagen, in his valuable "Art and Industry in England," speaks highly of several of Ostade's works in the collection of Sir Robert Peel. Lord Ashburnton, Mr. Hope, his late Majesty George IV, Mr. Beckford, and in the Bridgewater and Dulwich galleries. Ostade died in 1655, at the age of 75.

OSTADE, ISAAC VAN, born at Liége in 1617, was the brother of Adriaen, from whom he learned the art of painting, and whose manner he imitated so closely that some of his copies after Adrian have been frequently ascribed to the latter. He died young, which hindered him from acquiring the excellence that he would probably have attained. He is generally characterised as much inferior to his brother, but Dr. Waagen, after carefully examining his pictures in the collections in England, says of him:

"Great injustice is done to Isaac van Ostade by the poor praise that his works receive in the catalogues of the galleries in Germany. In Holland, in Paris, and above all in England, we may be convinced that in his village scenes and in his winter-pieces he is a wholly original master, and by no means inferior to his brother." The Dulwich Gallery here does justice to his merits by admiring a picture by Isaac (1 foot 9 inches high and 1 foot 6 inches wide) in the collection of Sir Robert Peel, who paid 400 guineas (not 4000, as it stands both in the German and the English, through a typographical error) for it—a price which the Doctor thinks reasonable in comparison with others. Dr. Waagen describes other capital pictures by Isaac van Ostade at Lord Ashburnton's, in the Bridgewater Gallery, and in the private collection of G. W. Van der Goes.

OSTEND (properly written Ostade), a fortified town and seaport of West Flanders, in 51° 14' N. lat. and 3° 54'.

X long., 12 miles west from Bruges and 25 miles east-north-east from Dunkirk. The town is clean and well-built. In 1834 it contained 1403 houses, 57 streets, and 5 squares, 3 church, 6 schools, a hospital, and a town hall, which is a large and plain but handsome building: the population is 11,390. The town stands upon a plain, and is entered by four gates. Of late years it has been much frequented during the summer as a watering-place; it is approved of for its healthful climate and excellent baths. The ramps form an agreeable promenade.

Ostend has great facilities for carrying on trade with the interior by means of canals. The Ostend and Bruges canal is of sufficient dimensions to allow the largest Indian steamer to pass between the sluices. By the canal from Bruges to Ghent, which is a continuation of the cutting from Ostend to Bruges, and which communicates with the Scheldt, Ostend is connected with the heart of the kingdom of Belgium. This town has recently been rendered of more importance by the system of railroads established in Belgium, by which it is intimately connected with Bruges, Ghent, Courtray, Termonde, Maas, Brussels, Antwerp, Louvain, Tournai, and Liége. By means of these works passengers landing at Ostend may easily reach Liege, with a journey of 170 miles. The route from London with England is kept up by steam-vessels, which leave London and return twice in each week, performing the voyage in about 14 hours.

The number of vessels that arrived and cleared from the port in each of the years from 1833 to 1836 was as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Inwards</th>
<th>Outwards</th>
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<tr>
<td>1833</td>
<td>1998</td>
<td>2361</td>
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<tr>
<td>1834</td>
<td>2363</td>
<td>2602</td>
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<tr>
<td>1835</td>
<td>2467</td>
<td>2840</td>
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<tr>
<td>1836</td>
<td>2508</td>
<td>2913</td>
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</tbody>
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The imports consist chiefly of colonial produce, wool, wine, and British manufactured goods: the exports are agricultural and cultural, linens, leather, oak bark, tallow, and salt.

Ostend was a small village in the ninth century, but two centuries later the port was much frequented. Old Ostend was destroyed by fire in 1334. In 1372 the new town was established, and until 1601 it was merely a fishing-place. It was enclosed with walls by Philip the Good in 1445, but was not regularly fortified until 1583 by the prince of Orange. The Dutch sustained a siege in this town against the Spaniards, which began in 1571 and continued until 1576. The town was destroyed by the English in 1578, but restored in 1579. The town was invested by the French in 1584, and the town was taken by the French, which were successful by attack. The place was completely razed to the ground, and Oestend was never again reoccupied.

OSTERWALD, JEAN FREDERIC, born at Neufchâtel in Switzerland, in 1653, studied at St. Maur, Orleans, and Paris, where he returned to his native country, and in 1699 was appointed pastor of the Reformed church of the town of Neufchâtel. He became noted for his zeal in instructing his flock, as well as for his theological learning. He was a celebrated writer, with arguments or explanatory heads to the books and chapters, which became very popular among the French Protestants under the name of "Osterwald's Bible," and of which there have been several reprints. He published also, with Mazarin, the "Bible de la Corruption qui reigne aujourd'hui parmi les Chrétiens," "Traité contre l'Impureté," "La Catechisme which is much used in the French Protestant churches, and is by far the most valuable of those of the French language," and other religious works. Osterwald died in 1747, much regretted. He and his two friends, J. A. Turrettin of Geneva and Samuel Werenfels of Basel, did much toward the revival of learning in Switzerland; and were the chief promoters of the revival of learning in Switzerland.

OSTIA, OSTUM, the ancient name of the former port of Rome.
OST

Tiber, is 16 miles from the capital. The antient town of Ostia, which was situated below the fork of the river, opened in a semicircular form along a bend made by the left or southern branch, on a piece of ground slightly elevated above the surrounding sand and marshes. Ostia was founded by Lucius Quinctius and serving over to the sea. It stood on a narrow peninsula between the river and the Lacus Ostinum, now Staglio d' Levante, which formerly communicated with the sea, but is now separated from it by a considerable tract of sand. The port appears to have been a mere an- cien near the side of the mountain. It stood on a low- ered from another account, seems the more probable of the two, the individual against whom there was the greatest number of votes was straightly sentenced to ten years' banishment, or, if the number of persons voting from another account is adopted, the person who was ostracised was obliged to leave within ten days after the sentence, and unless a vote of the people recalled him before the expiration of that time, to stay in exile for ten years. The goods of the ostracised person were not confiscated; neither was Ostracism considered in the light of a punishment or account of disgrace. It passed for what it was, a declaration of superior wealth, of superfluity, influence, and social virtue, whose ascendancy the state dreaded.

It is well known that this form of ostracism was one of those on whom Ostracism was inflicted. The story told by Plu- tarch of his writing down his own name for Ostracism is also well known.

The present time at which the institution of Ostracism was introduced is not known. It is generally believed that it was introduced by Cleisthenes after the expulsion of the Pisistratidae (Athen. Var. Hist., viii., c. 24); and it has been said also that Cleisthenes was the first victim. This however does not rest on very good authority. The first person ostracised was most probably Harmachus, a relation of Pisistratus; the last was Hyperbolius.

As to the merits of such an institution as Ostracism, there cannot be any great difference of opinion. That must be acknowledged which needs it, though under a bad form of polity it may be itself a good thing. The statesman is to construct a government proof against the wealth and power arising from the ordinary course of social development: if he fails in this, he must defend the government, even at the expense of partial evil. The Athenians took care to mitigate the severity of the banish- ment, so far as they could consistently with the object of it. 'Though this institution,' says Montesquieu, 'may be so far a condemnation of popular governments, yet it is, on the whole, in their mildness; and we should have perceived this, were it not that that which is for us always a punishment, we have been unable to separate the idea of ostracism from that of punishment.' (Leçipat des Lois, book xxi., chap. 17.)

As the others were reviled in Argos, Miletus, and Megara. At Syracuse also it prevailed, and there bore the name Petalium, leaves (σκίθα) being used on the occasion of voting, instead of shells.

OSTRACOS. [BRANCHIPODA, vol. v., p. 241.]

OSTREA. [Ostracoda.]

OSTRICH. [Struthionidae.]

OSTROGOTHs, or Eastern Goths, a division of the great Gothic nation, were settled in Pannonia in the fifth century of our era, from whence they extended their do- 

throughout Europe, and established themselves in Moesia. (GORINI.) About the year 482 or 483 A.D., their king Theodoric was serving as an auxiliary under the emperor Zeno, and dis- 

in his own territory. (Gorini.) About the year 482 or 483 A.D., their king Theodoric was serving as an auxiliary under the emperor Zeno, and distinguished himself in his own territory. (Gorini.) About the year 482 or 483 A.D., their king Theodoric was serving as an auxiliary under the emperor Zeno, and dis- 

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in his own territory. (Gorini.) About the year 482 or 483 A.D., their king Theodoric was serving as an auxiliary under the emperor Zeno, and di-
over Italy, which is generally styled the reign of the Goths in that country.

OSTROPODA. [BRANCHIPODA, vol. v., p. 241.]

OSTRAVIA, or Hop Hornbeam, derives its English name from its inflorescence consisting, in the female, of scales packed closely over each other so as to resemble very much the head of a hop, and to its foliage being similar to that of the hornbeam. Two species are known: the one, O. vulgaris, a native of the South of Europe; the other, O. virgincia, of the United States; these are possibly more varieties of each other. They both have leaves of small size, but sometimes acquiring a height of 60 feet. For figures and a more particular account, see Loudon's Arborum Britannicum, p. 2015, fig. 1939 and 1940.

OSWALD, a town in the kingdom or province of Seville, in Spain, situated at 37° 17' N. lat. and in 5° 9' W. longitude. It is about 40 miles from the city of Seville, and situated on one side of an extensive plain, at the foot of an eminence which is crowned by a church. The town is semicircular in form, and is of considerable size; it contains above 2300 houses, and 16,000 inhabitants. It has one parish church and a collegiate church, fourteen convents (suppressed in 1835), and eight hermitages; it also has four hospitals, two barracks, ten large inns, and a public granary. The university, which was called University of Seville, and at the time of Fernando VII. was abolished by royal decree in 1824. The town is neat and pretty, and has some fine promenades and shady orchards in its immediate vicinity; it is deficient in good water. The climate is salubrious, except during the heats of summer, when, according to the doctor Agustín de Suárez, the thermometer sometimes reaches 110° Fahr., and rises even higher when the wind is easterly. Some small lakes, a few miles to the north of Osuna, at that season also infect the air in their neighbourhood. The extensive exactions and valorization of Osuna is almost entirely agricultural; the only manufactures are mats, ropes, and baskets from the esparto rush (stipa tenacissima). The vast plain in which it stands is said to be the most fertile grain district of Andalusia, and gives rise to excellent pastoral products; but it yields also much wheat, beans, peas, lentils, and other pulse, some wines of inferior quality, excellent capers, which are preserved with salt and sent to the neighbouring cities and even to America, and abundance of the coccus liceus and reseda lutea, used in dyeing. It contains also large pasture-grounds, on which numerous horses, horned cattle, and swine are reared. The annual contribution of Osuna to the royal treasury exceeds 4000l.

Osuna is of very remote origin. Conde says it was an independent town under many Roman, Moorish, and Christian remainings are still found in the town. The Arabs called it Osbuna.

(Osuna; Conde, Alecris.)

OSWEGO. [CANADA.]

OSWEGO, a corporate town in the parish and hundred of Oswego, in the county of Salop, 16 miles north-west from Shrewsbury, 160 north-west from London (direct services), and on the road from London to Holyhead. On this spot, says Pennant, 'celebrated in Saxon history and legendary piety, on August 5, 642, was fought the battle between the Christian Oswalt, King of the Northumbrians, and the pagan Powis, King of the Mercians. Oswald was defeated and lost his life. The barbarian victor cut the body of the slain prince in pieces and stuck them on stakes displayed as so many trophies. From the forge of the king the place in aftertimes was named Os- wald's Tree, now Oswestry. (Tour in Wales, London, 4to., 1778, pp. 246-8.) The miracles reputed to have been wrought by means of the earth taken from the field in which the remains were situated increase interest in his 'History of the Primitive Church,' and occupy several pages of that work (Hurst's, Translation, London, 1814, iii., chap. 9-13).

Oswald was admitted by the Romans into the list of their saints, and a church was raised to commemorate his martyrdom. In the corporate seal he is represented in his robes, holding a sword in his right hand and an oak-branch in his left; above are the words, "De Osualdis sigillum coming," the coat of arms of the town. Welsh 'Cae Nef't (Heaven's Field), there is a remarkably fine spring of water, which bears the name of Oswald's Well, and over which, as recently as the year 1776, were the ruins of a very ancient chapel, likewise dedicated to him.

The first charter was granted to the town in the reign of Henry II., by William earl of Arundel, the lord of the manor. The son of this nobleman having taken part with the barons against King John, the latter (1212) marched upon the town and reduced it to ashes. A similar fate befell it, about a century afterwards, at the hands of Llewellyn, prince of North Wales, and it continued to suffer from border-warfare until 1557, when it was fortified by a wall and ditch. Some portions of this was are yet standing, but the four gates were removed in 1749. The charter of Richard II., granted in 1397, after the arrival of the royal army under the Earl of Oxford, exempted the burgesses from all customs throughout the kingdom, and the liberty of the city of London excepted; and among other privileges acquired by them during this reign, was that of compelling the inhabitants of the eleven towns within the hundred to bring their cattle to market in Oswestry on sale in the market-place of Oswestry before sending them to any other market or fair. The lord's Welsh tenantry of the hundred were also bound by their tenure to keep watch and ward for three days and three nights at the gates of the town during the time of the lord's visitation. Oswald, but instead of protecting them were found to ravage and plunder the place, whereupon they were dismissed from that duty and compelled to pay a sum of money to Englishmen for the safe custody of the town.

The boundary of the present municipal borough extends about two miles east and west of the town, and half a mile north and south, and is divided into two wards. The governing body is composed of 6 aldermen and 18 councillors. The church of St. Asaph, dates from 1227, but was destroyed by fire in 1831, when the present structure was erected. The vicarage is in the diocese of St. Asaph, and patronage of Eastnor, Worcestershire, and comprises a annual net revenue averaging 471l. The trade of the town is facilitated by the Ellesmere canal and the Llanymynech branch, which pass within four or five miles. The manufacture of leather and leather-working predominates, but there is an increasing extent, particularly on the English side. It contains a town-hall and a small gaol, erected in 1623. The church, erected since 1816, is spacious and surrounded by a plain wall. The manor-house is in the diocese of St. Asaph and patronage of Eastnor, Worcestershire, and comprises an annual net revenue averaging 471l.

In an Act of 33 Geo. III. all the parishes within the hundred of Oswestry, with the exception of the parish of Melverley, are incorporated for affording relief and employment to the poor, and a poor-house has been built in the vicinity of the town. The number of inhabitants in 1831 was 2763. There is a national school, and Sunday-school. In the national school there are from 230 to 240 boys, and from 150 to 170 girls, all of whom receive daily instruction. The grammar-school was founded by David Holboche or Holbeck, prior to the year 1575, and has been open to all boys from that time. It is still a flourishing educational institution, as are a few of St. Asaph. The present revenue is derived, amounting only to 2685l. in 6d., appears to have been recovered with difficulty. There are other smaller charities in this place.


OSYTH. ST. [ESSEX.]

OTAHITE, or more properly O Tahiti, is the largest of all the Tahitian islands, lying 20° 30' S. lat., 157° 50' W. long. It is about 35 miles long, and more than 30 miles in circumference. It consists of two peninsulas, of unequal extent, united by a low isthmus, some 30 miles wide. The principal north-west peninsula is called Opunoe or Tahiti-nui (Great Tahiti), and the south-eastern Tiarirooo, or Tahiti-titi (Little Tahiti). The surface is estimated to be about 430 square miles, on the lowland of the vicinity of Bedford. The island is surrounded at a distance of from 3 to 6 miles, and has several breaks, and affords many good anchorage, as there is only one island within the Opunoe or not agitated by the winds. The most remarkable are, Matatawe Bay, near the north-eastern extremity; Soonas Harbour, four miles westward of Matatawe.
and Pipeiros, towards the north-western extremity of the island, which is now most frequented by European vessels. The interior of both peninsulas is occupied with mountain ranges, which terminate in long, sharp peaks. The most elevated of these peaks, called Opourone, rises to between 7000 and 8000 feet above the sea-level; it is nearly in the centre of the larger peninsula. Some of the summits of the smaller peninsula are nearly as high. Except these peaks and the general utterits, there is little to be said. The hills extend from the centre of the peninsula in all directions towards the shores, and approach them in some places within less than half a mile, enclosing low valleys, which extend 5 or 6 miles inland, to the foot of the mountains, which are much more elevated. In the interior streams, on the banks of which, as well as on the shores of the sea, are built the dwellings of the inhabitants. Lava, basalt, and pumice-stone, which occur in several places, seem to indicate that this island, like all the elevated islands of the Pacific, owes its origin to the agency of fire.

The climate is very mild, the differences of temperature in the winter and summer months being inconceivable. It is also very healthy, except during the rains, which occur from the beginning of February, but even then they are not frequent. The produce is very copious, especially the plants which supply food for men. The bread-fruit trees and cocoa-palms are regularly planted, and bananas, yams, taro, and bananas are cultivated with care; the bread-fruit trees, which are a most excellent fruit, are cultivated by the natives, and some other tropical plants are also cultivated. Cotton and indigo are also cultivated by the Europeans, the natives being too indolent to bestow the necessary labour on them. Several wild plants also afford food, especially the arrow-root, which is extensively used. It is grown almost everywhere, and is exported; there are also the casuarina-tree, a kind of cassia, and figs. Cloth is made, as in other islands of the Pacific, in the inner bark of the bread-fruit tree, the paper mulberry-tree, and the hibiscus; of the last also ropes are made. Oil is extracted from copra, and scrap is used for manure, and sugar is produced in great abundance. Forests cover all the mountains of Taaroa boa, and the southern declivities of those of Opourone. Some vessels have been built of the timber. When the Europeans first visited the island, the coconuts were yellow, and were knotted by their husks. The natives have introduced cattle, horses, sheep, and goats. The cattle and goats thrive, but the sheep and horses do not succeed so well. Wild birds are numerous, especially ducks, and several kinds of parrots.

Otaheite was discovered in 1606, by the Spaniard Quiros, and called Sagittaria, but as his description was not correct, Captain Wallis, who visited the island in 1767, considered it as a new discovery and called it King George's Island; and Captain Cook, who visited it between 1769-78 several times, gave it the native name, and published a very interesting account of the island and its inhabitants. He estimated the population at 200,000. After having been visited several times by each individual, who lives in his district, there to convert the islanders, in 1779. They found the natives, as they had been described, friendly to strangers and devoted of all treachery; but they discovered that several immoral practices existed among them, as infanticide and human sacrifices. There were also continual wars among them. For nineteen years the labours of the missionaries were fruitless, and they were treated with contempt. But in 1818 the king of the island, Pomaree II., embraced Chris-
tianity, and introduced it among the natives. After his death his son, Pomaree III., embraced Christianity as well, and the missionaries were received with approbation. They now acquired a greater influence, and by their advice a con-
cession was formed, and written laws were made (1825); but as neither the constitution nor the law are understood, as they are founded on the customs and usages of the na-
tives, they are not observed. The government of Christianity has however effected the abolition of infanticide, of human sacrifices, and other immoral practices; it has also established peace. Before the son of Pomaree attained the age of manhood, he was proclaimed king by the people, and wore the crown. The government is a despotism; the sovereign possesses absolute power over the land, and may by an order deprive any chief or person of his landed property; each chief also possesses the same absolute power over his inferiors. The missionaries assert that, according to a census taken several years ago, the population did not exceed 3000 souls, and they attribute the great decrease to the venereal disease, which was introduced by Europeans, to the continu-

ous wars, and to infanticide. The natives belong to the Malay race, and speak a language which may be considered as a dialect of that widely spread language. They have made little progress in civilization, as is shown by their manu-
facture of cloth, called tappa, their boats, which are large enough to carry 150 persons, their dwellings, and their arts. They have not profited little by the presence of the missionaries, the chief among whom, the very intelligent wooden frames filled with wattle hibiscus, and covered with a compost of sea-sand and lime, which again is white-

washed. The culture of their fields and gardens has also not profited them much. They are, however, so intelligent that they have established a commerce, as there is no currency. Small quantitites of coco-nut oil, arrow-root, timber, and sugar are bartered for ribbons, cloth, &c., and these are the only articles which are exported. (Cook's Voyages; London Geogr. Journal, vol. i. iii. v.)

OTA'RIA. [Szals].

OTHMA'N (Ibn Affan), the third khilif of the Mo-lems after Mohammed, was a direct descendant from Abd al-
menal, one of the ancestors of the prophet. Having early espoused the Koranic religion, he was among the first of his most zealous ashbds (companions), followed him in his flight from Mecca to Medina, and was, on his return, one of his most confidential friends and secretaries. [Ali (Ibn Umar).] Othman was one of the six individuals to whom the khilif 'Abd Allah assigned the execution of an emperor; they have been considered as the successors of a successor. After mature deliberation, the majordom Othman, on condition that he would govern the people according to the rules of the Koran; Othman consented, and has been considered as the second man on earth; he has been invested with the supreme power towards the end of the third Caliphs, from Nov. or Dec., A.D. 644, three days after the death of Omar. His first public act was to send a body of troops under Al-mughebeyth Ibn Shaahab to complete the conquest of Egypt; while another army expelled Jezidegd from Persia (A.D. 646). [Omar.] Another body of Arabs (A.D. 647) reduced all that part of Khorasan which had escaped former inva-
sions. In the meanwhile Abdullah Ibn Said invaded eastern Asia Minor, and, after defeating and killing at Yakkuyah, the patrician Gregorius, who commanded in the Persian emperor's name, subdued its principal cities. Four years afterwards (A.D. 651) the same commander made an incursion into Nubia, and obliged the Christian sovereign of that country to sue for peace and pay him tribute. The islands of Cyprus and Rhodes were attacked and plundered by Muwiyah Ibn Abi Sufyin (A.D. 648): these two maritime expeditions being the first which the Arabs ever made. While the Mohammedan empire was in its infancy, the Turks, who also had established themselves in the neighborhood of the native land, and who were engaged in the wars of the Crusades, Othman was rapidly losing the affection of his subjects by the weakness of his internal administration and his partiality towards the members of his family. Abi-l-
feik, the Arab historian, says, that some one having heard that Othman's wife had espoused his successor, he exclaimed, 'God forbid that I should; Othman is too much inclined to favour his own friends and relations.' In this judgment Omar was not mistaken. Othman began by removing the celebrated Amr Ibn Al-as from the government of Egypt—a country which he had conquered—and appointing in his place his own foster-

brother Abdullah Ibn Said. This measure was as dis-
agreeable to the Arabs as to the Egyptians. The people of Alexandria, who bore impatiently theを見せ, were only kept in obedience by the mildness and the justice of their governor, seeing a favourable opportunity, entered into a correspondence with the Greek emperor, and surrendered to him the city; and, though Othman imme-

diately regained the possession of the city, the Turks demolished its fortifications, this was not accomplished without great difficulty and considerable bloodshed (A.D. 646). Sa'id Ibn Abi Wakkas and Abu Missa Al-sharad, two of Mohammed's companions, were also deprived of his favor on his command, and his head was held aloft by occupying on the Minbar (pulpit), and while at prayers in the mosque, the same place which the prophet had used, instead of placing himself, as his predecessors Omar and Abu Bekr had done, a few steps lower down. He had also lost Omar on his throne as a silver ring which had once belonged to the prophet, and which the khilif his predecessors had sealed their dispatches—

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an ominous circumstance, which was regarded by all zealous Moslems as the greatest blow that could be inflicted on their rising empire—and he had recalled from his exile Hakan Ibn Asael into his service: himself had banished from Medina. Othman was further accused of excessive prodi-
gality towards his favourites. These and other complaints against Othman increasing the public discontent, the leaders of the Arabian tribes and the most illustrious among the leaders of the prophet's sect, the pasha, and his family, and he was dr"awn up a memorial in which their charges, nineteen in number, were fully specified, they despatched with it one of their number, Ammar Ibn Ishaq, threatening Othman with im-
mmediate deposition unless he gave a satisfactory answer to ev"ery one of the complaints. Othman remonstrated with it as an overture upon his authority, and caused Ammar, the bearer of the memorial, to be so severely beaten by his slaves, that he was left for dead on the ground. This unjustifiable act inflamed the passions of the people, who now openly de-
demanded Othman's abdication. Deputations from all the provinces of the empire, having the same object in view, reached Medina, and Othman was closely besieged in his palace by a large body of insurgents. In vain did Othman promise to restore to the treasury the sums he had ab-
stained from paying; still greater were the grievances that
plaints; the fury of the people increased instead of abating, and they would undoubtedly have committed violence upon his person had not All, who had considerable influence among the insurgents, promised that the name of Othman should be
immediately removed. The tranquillity, by these means restored, was but of short duration. Ayessa, the widow of the prophet, who hated Othman, and who had seen with envy his accession to power said she would remove the caliphate of the
khalifate. By her authority around the Arabian tribes, as well as by her intrigues, she succeeded in creoxating great di
dissatisfaction against Othman, and attacking the most influ-
ential people in the empire to her interests. She bribed Oth-
man's slaves, bought his objects, and transmitted orders in his master's name. One of these, addressed to Ab-
dullah, governor of Egypt, bid him put to death Mohammed, son of the khalif Abd Bekr, who was then residing at
Alexandria, and followed the party of Ayessa. No sooner was this man murdered, and caliphate of Othman's
was eagerly urged Othman to revenge the affront. He accordingly marched against Medina, which he en-
tered without opposition, and invested Othman's palace. Af-
"er making some resistance, Othman's soldiers left him to
his fate. Plagued by a Koran Koran, he calmly awaited the arrival of the assassins, who, headed by Mohammed, rushed into the room. The incensed youth seized Othman by the beard, and plunged his sword into it, and the other body in different parts, and he expired under numerous wounds. For three days his mutilated corpse lay unburied and exposed to the insul

s the populace, until it was at length thrown into a hole. This happened, according to At-tabari and Abd-I-
fehus, N. 335; A day of Dhi-hijjah, a. d. 35 (5th June,
656); other historians assign earlier dates to this deplorable event, although all agree in placing it within that month. Othman reigned twelve years, and was eighty-two, others say ninety, and even ninety-five years old when he died. He had been married to two of the daughters of the prophet, Raziya and Ome Al-Kholthum, to which he is ge-
nerally designated by the Arabian historians under the surn
ames of Dhi-n-ninaym (he of the two lights). Othman is described as a man of majestic figure and venerable aspect; he was said to be versed in the Koran, which is reported to have transcribed several times. He was the first who caused an authentic copy of the Koran to be made, from which all other were to be transcribed. He entrusted the care of the Koran to Reyd Ibn Thabit, Abdullah Ibn Zo-
beys, and other companions of the Koran; and the eleventh century of our era, a copy of the Koran called Muse-
hafi-i-Othamind (the volume of Othman) was preserved in the great mosque at Cordova, being thought by some au-
s of the Koran to be the leaves of the book placed in his bow
and stained with his blood, and by others to be one of those copies which the Khalif was known to have written himself. (As-sourati History of the Khalif, in MS., in the Brit.
Othman's, N. 88
Othman, a. d. 358 (1259). The Turkish and Arabian historians do not agree as to his ancestors and origin, but the most generally received opinion is, that he was the son of Orthogul, a Turkman or Avarian chief, who had distinguished himself in defence of the sultan of Iconium, established himself with his tribe at
Surgut, on the banks of the river Sangar. It is further related that his grandfather Suleyman left his native steppe in the Maksur-l والع (beyond the Oxus), passed into Kho-
bour, and then continued his flight towards the Akh. He arrived in the region of Bithynia (A.D. 1218-19) (Ghorgan Khan), and settled at Kelik in Arme-
nia. After the death of Suleyman, who was drowned in the Euphrates, his son Orthogul succeeded him in the command of the tribe. He marched further into Asa
hbor, and entered the service of Alau-0d-din Caybey, the ninth sultan of the Seljukian dynasty, whose reign began in
A.D. 1213. Having received lands to settle in with his tribe, Orthogul rendered important services to Alau-0d-din and his successors, aiding them in their wars against the Turk-Xors and against the Greeks. He was invested with the
office of Genoese (A.D. 1260), leaving his son Orthogul to succeed him in the gov-
ernment of the colony. After the death of Masud II., the last of the Seljukides, his dominions being shared among his generals, Orthogul fell to the lot of Othman, who thus found himself the master of a small territory. The first campaigns of this conqueror were directed against the Greeks. In July, A.D. 1299, having first forced the slightly-defended passes of Mount Olympus, he invaded the plains of Thrace and the country, except the capital itself, which fell four years after wards into his power (1304). In 1307 he invaded and re-
duced the country of Marmara. The annals of the first years of his reign exhibit the same repetition of successful invasions until, seen his immense forces, the Greeks turned volunteers, he meditated and carried into execution greater undertakings. Instead of retreating as before, after each incursion, to the hills, he maintained the most useful and defensive posts, fortified the towns and castles, and strove to maintain his dominions, he prepared himself for the enemy. In the course of many years of warfare he con-
quered the remainder of Bithynia and the neighbouring provinces; and although he was several times repulsed in his attempts upon Niceae and Prusa, he kept those places in his hands. He employed the talents of his subordinates, and the richness of his dominions, in his own interests. He frequently rewarded his faithful soldierns, the generals, the
volunteers, and the valiant men of his army. The prince of his own blood, he was the most pious of his subjects, and the most enlightened. In his person, he was a model of virtue, temperance, and piety. He was the author of a work containing many grammatical questions (Quenta Grammatica); another, De Heredisit, and a third, De Mensuris Hispanica. (Castr., Biblioth. Arabico-Hisp. Ecer.), t. ii., p. 107.
Othman, Abd al-faraj, (Abdul) Ibn Yahia al-Acalisi, was born at a noble family at Malaga in Andulucia. He was mentioned as a man of great and varied talents, and as having been emi-
ted in the study of jurisprudence, and medicine. He was made governor of Malaga, and died A.D. 1232. He was the author of a work containing many grammatical questions (Quenta Grammatica); another, 'De Hereditate,' and a third, 'De Mensuris Hispaniae.' (Castr., Biblioth. Arabico-Hisp. Ecer.), t. ii., p. 107.

"s more than sixty-year

Christian years."
Otho, Marcus Salvius, was born on the 28th of April, A.D. 31 or 32. He was descended of an honourable family, which originally came from Ferentium (Feronentina), and which traced its origin to the kings of Etruria. His grandfather, who belonged to the equestrian order, was a senator through the influence of Livia Augusta, but did not rise higher in office than the praetorship. His father, Lucius Otho, was advanced to offices of great honour and trust by the emperor Tiberius, whom he is said to have resembled so closely in person as to have been frequently taken for a near relation.

Marcus Otho was an intimate friend of Nero during the early years of his reign, and he associate in his excesses and debaucheries; but Nero's haughty temper and the methods employed by him attempted to produce a coolness between them, and ultimately occasioned the honourable banishment of Otho to the province of Lusitania, of which he was appointed governor. To lighten his task, the emperor chose a governor of his own choosing, instead of sending him back to Rome. (Otho, c. 3), with great justice, he remained for ten years; and afterwards took an active part in opposition to Nero and in placing Galba upon the throne, A.D. 68. Otho appears to have expected, as the reward of his services, that he should shortly be made a bishop with a benefice; but when Galba proceeded to adopt Piso Licinianus as his successor, Otho formed a conspiracy among the guards, who proclaimed him emperor, and put Galba to death after a reign of only seven months. (Galba.)

Otho was himself proclaimed by ingratiating himself with the soldiery, whom Galba had unwisely neglected to conciliate. He yielded to the wishes of the people in putting to death Tigidillus, who had been the chief minister of Nero's pleasures, and he acquired considerable popularity by his munificence. He was immediately recalled and put to death, A.D. 69. (Tacitus, Hist. ii. 42.)

In the year 935 he gained a great victory over the Huns. In Italy he appeared first as the champion of Adelaide, the young widow of king Gislararius, who was imprisoned and otherwise ill-used by Berengarius, who, after poisoning his son, had succeeded the Italian crown. Otho liberated Adelaide, whom he married at Pavia, in the year 951, and forgave Berengarius, and allowed him to retain the sovereignty of Italy, but as his subject. Otho then returned to Germany. After some fresh complaints of the tyranny of Berengarius induced Otho to recross the Alps: he defeated Berengarius and his son and colleague Adalbert. He was himself acknowledged by a Diet held at Milan as king of Italy, and crowned by the pope in the church of St. Ambrose, at the close of A.D. 961. In the following year Otho repaired to Rome, where pope John XII. crowned him emperor of the West, as being the successor of Charlemagne. Berengarius, who had still some followers, defended himself with valour in the fortress of St. Leo, in the Roman; but being taken, was sent prisoner to Bamberg, where he died.

Meantime Otho, having received numerous complaints against pope John, whose licentiousness and tyranny had become conspicuous to the people, and to whom he attributed his power, and moreover maintained secret intelligence with the partisans of Berengarius, again visited Rome, and assembled a council, in which John was deposed, and Leo VIII. elected in his stead. John however, with the aid of his partisans, again entered Rome, obliged Leo to run away, and committed many acts of cruelty against those who had favoured the exaltation of his rival. (John XII.) John soon after died, A.D. 994, and the Roman clergy, disregarding the former election of Leo, appointed another, such as Anastasius. Upon this Otho again entered Rome, and having put the leaders of the insurrection upon their trial, hanged thirteen of them, and condemned the others to various punishments. The historian Liutprandus justifies the conduct of Otho on this occasion, saying: 'he was only acting in accordance with the prerogative, like his predecessors of the Byzantine and Carolingian dynasties, against men who had violated their oaths and rebelled against his authority. This shows that at that time the ducy of Rome was still considered as subject to the emperor.

In the year 967 Otho had his son Otho II. crowned emperor and his colleague, at Rome, by pope John XIII. In the following year Otho sent Liutprandus on a mission to Neophorus Florus, emperor of Constantinople, which however produced no friendly result. (Liutprandus.) Otho accordingly invaded the provinces of Campania, Apulia, and Calabria, which were subject to the Byzantines, and laid siege to Bari, which however he did not take. Neophorus in the meantime purchased peace by being made bishop of Apulia; Zimisces made peace with Otho, and gave the princess Theophania in marriage to his son, A.D. 972. Otho returned to Germany, where he died in May, 973. Otho has been styled 'the Great,' a title which he deserved for his abilities, his success, and the love of his subjects towards the see of Rome is worthy of notice, for whilst he showed himself zealous for the interests of the church, endowed abbey and convents, and honoured deserving men among the clergy, yet he always asked in temporal matters, and in the elections of the papacy, the right which his successors continued to exercise for a long time afterwards until the pontificate of Gregory VII. In Italy he established the supremacy of the German emperors over the greater part of the peninsula, with the exception of the southern provinces, which remained subject to the Eastern empire.
OTHO II, son of Otho I., was engaged after his father's death in a war with Henry, duke of Bavaria, whom he defeated, and whose see he bestowed on the duke of Swabia. He also came to contend against Lotharius, king of France, for the possession of the great see of Lorraine, or Lorraine, which had been a subject of contention between France and Germany ever since the separation of the two crowns. Otho divided Lorraine into two feuds, upper and lower, the latter of which he left to Charles, Lotharius's brother, on condition that the former would pay allegiance to the German crown. In the year 979 Otho repaired to Italy, where things were as usual, in a state of great confusion. At Rome he repressed anarchy, and punished several of the leaders. From Rome he proceeded to Campania, where he fought against the Saracens, who had landed in those provinces, and whom he was said, as by the Byzantine emperor, who was afraid of losing his Italian dominions through Otho's ambition. Otho occupied Tarentum, and at first was successful against the Saracens; but he afterwards was defeated by them with great slaughter. (Sifonius; Dittmar; Mo- ratia.) Otho then repaired to Northern Italy, assembled the general diet of the secedatories of Germany and Italy at Verona, in the year 983, at which his son, then four years old, afterwards Otho III., was acknowledged as his successor. At that diet several laws were added to the Longobard code, and Otho confirmed the privileges of the cities and colleges of the republic of Venice by a diploma, in which are enumerated the provinces that were subject to the kingdom of Italy as distinct from those belonging to Venice. The former are Pavia, Milan, Zara, Caen, Como, Verona, Padua, Ferrara; the latter, Genoa, Udine, Cividale, Canosa, Rovigo, and Treviso. Otho proceeded to Ravenna, and afterwards to Capua and Benevento, intent upon collecting a large army against the Saracens, whom he wished to expel from Sicily. But in the month of December, 983, he fell ill at Rome, was soon dead, and was buried in the atrium of the Vatican Basilica.

OTHO III. spent his long minority in Germany, whilst his grandmother Adelaide, his mother Theophania, and the archbishop of Cologne administered his dominions in Germany and Italy. In the year 996 Otho entered Italy with a large army, and was crowned emperor of Germany, at Rome, by Pope Gregory V., who was his own relative. On his return to Germany, he defeated the Slavi, with whom he had engaged in a war, and forced Meinrad, duke of Poland, to do him homage. He afterwards conferred upon his successor, Duke Boleslas, the title of king of Poland. At the end of 997, Otho returned to Italy; and after staying awhile at Pavia and Ravenna, being desirous of seeing Venice, a city then already celebrated for its wealth and power, he repaired thither incognito with six attendants. The doge Pietro Orseolo II. entertained him splendidly by night, but left him to enjoy his assumed disguise during the day. The doge had just effected the conquest of Dalmatia from the Croats, with the islands of Corzola and Lussin; and had assumed the title of duke of Dalmatia. Otho held a daughter of the doge's over the baptismal font, and on that occasion he excommunicated the Venetians from the pulpitum, or annual tribute, which they used to pay to the kings of Italy. Having returned to Ravenna, he collected his army and marched upon Rome, from whence Pope Gregory V. had been expelled by the patrician Crescentius, styled consul of Rome; a remarkable character of the dark ages, who aspired to re-establish the Roman republic under a nominal allegiance to the Eastern emperors. Crescentius caused John, a Calabrian Greek, to be proclaimed pontiff, under the title of John XVII. On the arrival of Otho, John ran away; but being seized by those of the adverse party, he was cruelly mutilated; and Crescentius, after defending himself in the castle St. Angelo, was also made prisoner and beheaded, with twelve of his followers. Otho returned to Germany, but in the year 1001 he was again in Italy. He fought several battles in Campania, besieged Benevento, and afterwards quelled some fresh disturbance in Rome. In the following year, 1002, he was taken ill near Civita Castellana and died. His body was taken to Aquignana to be buried.

OTHO IV., duke of Brunswick and son of Henry the Lion, was elected king of the Germans in 1208, and afterwards crowned emperor at Rome by Innocent III. But he soon quarrelled with that imperious pontiff about the rights of Augsburg and various other matters, and Otho returned to Germany, where Waldemar, king of Denmark, was extending his conquests along the southern coast of the Baltic. Soon after a general discontent, which was encouraged by the clergy, burst out against him, and he was deposed in 1212; and Frederic of Henneberg, count of Hessen, king of Sicily, was called to fill the throne of his ancestors. Otho however had still a considerable party, and he protracted the contest till 1215, when he resigned his claims to his rival. (Fossa B. Emper.)

OTHO, or OTTO, OF FREYSINGEN, born about 1100, was the son of Leopold, margrave of Austria, and of Agnes, daughter of the emperor Henry IV. He studied first at Nürnberg and afterwards in the university of Paris, after which he entered the order of St. Bernard in the abbey of Morimond, of which, in 1136, he was made abbot. His relative Conrad III., king of the Germans, recalled him to his native country and made him bishop of Freisingen in 1138. He afterwards followed Conrad in the crusade to Palestine. On his return, he felt a wish to visit the abbey of Morimond again, where he died, after a short illness, in 1158, much revered for his knowledge and piety. He wrote a chronicle of the world in 7 books. 'Ottonis Episcopi Freisingensis Rerum ab origine mundi ad ipsam usque Tenta eam feliciter accessit libri quatuor de historiis et gestis Taurinorum Haec verum et medium est, Dominus sibi de Suzonio haec modeli et usque ad annum 1139, saeclum 12th, libri III. notoris et memorabilibus suis, the last three books contain much original information, especially concerning the affairs of Germany in the 12th, 13th, and 14th centuries, and are sufficiently judicious for the times in which they were written. His Chronicle is continued down to the year 1210 by another Otho: 'Appendix Otonii a S. Blaso a fine libro sensim, Ottonis usque ad annum 1139.' The other works of Otho of Freisingen are 1. A treatise concerning the end of the world, according to the Book of Revelations, which is generally appended to his Chronicle; and 2. A history of the emperor Frederic I, called Barbarossa, 'De vita et gestis Frederici regis, sive Alfonsi, qui anno 1190 in fausto duello post mortem Frederici, anno 1199, has been continued by Radewin, canon of Freisingen, down to 1160. Otho is one of the most trustworthy historians of the period generally called the dark ages. (Vide, De Historiae Latinae; Fabricius, Bibliotheca Latina mediae aetatis.)

OTIOLOPHES (Oitolphi), Cuvier's name for a group of Batrachians [Frogs, vol. x. p. 491], which have the muzzlesparsely covered with minute spines or spicules.
angular, and the head furnished on each side with a crest which extends over the parotid portion.

Type. Rana margaritifera, Gmel.

Description.—Head triangular, approaching to square above, and with elevated borders presenting an appearance somewhat resembling the episcopal mitre; eyes of a fire red; body above speckled with bright red, and splotches of small white speckles, and below with slight yellowish; a small white line springing from the mouth runs down on each side of the head and along the sides of the body, which is whitish and granulated also like the back and upper parts.

Locality.—Brazil, where, according to Seba, it is called *Aqua marina.*

OTON. [Class., vol. viii., p. 207.]

OTUS. [Bourdier.] OTOLICUS, illiger's name for the Galago of Geoffroy. Dental formula: this is generally given by authors thus:

In the species which we select to illustrate the form, Dr. Andrew Smith found the dentition as follows:—

- Incisors, 2 or 4; canines, 1-1; molars, 5-6.

In the species which we select to illustrate the form, Dr. Andrew Smith found the dentition as follows:—

- Incisors, 2 or 4; canines, 1-1; false molars, 2-2; true molars, 4-4 = 18 in each jaw.

Generic Character.—Head rounded, muzzle short, eyes very large, ears very large. Feet pentadactyle; all the nails flat with the exception of the first digit of the hind feet, which is armed with a sharp subulate claw. Two toes. Tail very long, loose, and villous.

Geographical Distribution of the Genus.—Africa, to which Mr. Swainson adds India.

Habits.—Arboreal. The great size of the orbits will at once strike every observer. The large development of the eyes requires such spacious receptacles; and this development is necessary on account of the nocturnal habits of the genus. The food of these animals consists of soft fruits, and, from the structure of the teeth, probably of insects also. They are fond of vegetable gum, and their large ears are laid to when they sleep, but to be opened upon their hearing the least noise.

We select as an example the Galago Moholi of Dr. Smith.

Description.—Colour: Upper parts of the head and neck, the back, the sides of the body, and the outer and hinder surfaces of the extremities intermediate between pearl and yellowish grey; the back is finely brindled from the dark colour of the basal portion of the fur being here and there seen through the surface tints; the extremities are of a lighter hue than the other parts enumerated, and their outer and hinder surfaces are distinctly tinted with yellow; the middle of the face, the lips, the sides of the head, below and behind the eyes, the chin, throat, abdomen, and the upper surface of the fingers white; inner surfaces of extremities white, tinged with yellow. Tail glossy; the colour intermediate between yellowish-brown and cochineal red; the fur is throughout of the same colour; that of the other parts is a dark slate-colour except at and near its surface. Ears flesh-coloured; and the down, which is very sparingly scattered over their outer surface, is pure white. Eyes deep topaz yellow; the palms of the hands and under surface of the fingers are of a flesh-colour tinged with brown. Form, etc.—Figure slender and elegant. Head broad, subglobular, and anteriorly terminated by a short, high, and almost pointed nose. Ears large, bare, and patulous, their tips rather narrow and slightly rounded; the outer margin of each ear has two faint emarginations, and the internal or anterior surface of each is distinctly marked with four or more transverse ridges; the eyelids and the pupilli large; anterior extremities short and slender; posterior ones long, rather robust, and each is terminated by four fingers and an opposable thumb, the tips of which are dilated and depressed; the nail of the forefinger of each of the hinder extremities is narrow, convex, considerably elongated beyond the soft parts, and obtusely pointed; all the other nails both of the anterior and posterior extremities small, thin, flat, roundish or ovate in form, and not extended to the points of the fingers. Tail cylindrical, slender towards the base, much thicker towards and at the tip, which arises from the fur being longer on those parts. On the head, body, and extremities the covering consists of a very fine short woolly fur, which on the tail and the upper surface of the fingers is rather harsher. Palm of the hands and under surface of the fingers naked. (Smith.) Length from nose to tip of the tail, sixteen inches.

Locality. Southern Africa, and probably Western Africa. Habits, Reproduction, Food, &c.—The first specimens observed by Dr. Smith were upon trees close to the Limpopo river, in about lat. 23° south, and from that parallel he continued to observe others as the expedition travelled. They were very active, springing from branch to branch and tree to tree with extraordinary facility, and always seized the branch on which they intended to rest. In their manners they considerably resembled the monkeys, particularly in grimaces and gesticulations. According to the natives,
the species is entirely nocturnal, and rarely to be seen during the day, which the animal spends in the nest which it has formed in the forks of branches or in cavities of decayed trees; and in these nests, constructed of soft grass, the females bring forth and rear their young (generally two at a birth). Dr. Smith states that the food of the Moholi consists principally of pulpy fruits, though there is reason to believe it also consumes insects, as remains of the latter were discovered in the stomachs of several individuals which he examined.

Dr. Smith, for the reasons stated in his work, considers this animal different from Galago Senegalensis. He gives an elaborate anatomical description and good figures of the more important and interesting parts of this animal.

The Moholi.

Our figures are taken from those in the ‘Illustrations of the Zoology of South Africa,’ a work now in the course of publication under the authority of the Lords Commissioners of Her Majesty’s Treasury, and equally valuable both for the extent and novelty of its information and the beauty and accuracy of the illustrations.

Place in the System.—Illiger places Otiscus in the fourth family (Macroscelid) of his second order (Pseudalata), associated with Tarsius. The Macroscelid stand in his arrangement between the Prosimii and the Leptodactyla.

Cuvier, placing the genus between Stenops, ill., and Tarsius, arranges it under the Quadrupoda.

Mr. Gray, in his ‘Outline’ (Ann. Phil., 1825), makes Otiscus, Galago, and Chorogalias the genera which form his Galagonina, the fourth subfamily of his Lemuridae.

M. Leeson (1827) gives Galago—he does not notice Illiger’s name—a position between Nycticebus and Tarsius; and J. B. Fischer (1829) places Galago, Geoff. (Otiscus, ill.) between Jaculus and Tarsius.

Cuvier (1824) expressed his opinion that the Lemur Potto of Gmelin should be referred to this group; and M. Leeson places that animal under Galago, with the name of Galago Potto, Galago Guneenesis, Desm.

Mr. Swainson, who considers that nearly all the Lemurs appear to be reducible to two primary groups, the Lemurs proper (Lemur) and the Galagos (Otiscus, ill.), views the first group as eminently frugivorous, and the second as carnivorous, preying upon small birds, insects, and reptiles, and representing the Feræ. This latter group, Otiscus, in his observations, in general distinguished by the size of their hinder feet, or rather of the tarsus and toes, in which respect he thinks they offer a beautiful analogy to Miemura, Ratius, and Coerebras among birds. He traces the passage between the Lemurs and the Galagos in the genus Stenops of Illiger, where the tail, as in Lichanothrix,

*Chainspilius* must be meant.
and stone. There is moreover an O. dubna from the Knowsleymoor coalfield, and an O. ocellis from the Scarborough oolite, both of which are doubtful species; the latter must be excluded from the genus, and probably belongs to Neopteridia. A detailed account of the species will be found in the *Pesti Flora*, vol. ii. and iii., where the genus was first established, and where are figures from which the annexed cuts have been borrowed. For the present, the genus is the same as either the modern Adamantium, or Lindmania, with both which it agrees in the venation of the leaves.

O'Tranto, Terra Di, one of the territorial divisions of a particular must be excluded from the genus, and probably belongs to Neopteridia. A detailed account of the species will be found in the *Pesti Flora*, vol. ii. and iii., where the genus was first established, and where are figures from which the annexed cuts have been borrowed. For the present, the genus is the same as either the modern Adamantium, or Lindmania, with both which it agrees in the venation of the leaves.

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In the other parts of the skeleton there is nothing to justify a detailed description, the variations being such as might be expected to suit the habits of an aquatic, carnivorous, hairy quadruped. Thus, the articulation of the limbs admits of such freedom of motion, that the animal can turn them in almost any direction, and bring them with ease on a line with the body, so as to act like fins.

Digestive Organs.—The teeth of the Otters are sharp and strong, and the tubercles of the molars very pointed, a modification necessary to secure the prehension and speedy destruction of their agile and slippery prey. In the length of the intestines there is a difference between the Common Otter and the Sea Otter; the latter, like the Seal, has very long intestines. Sir Everard Home gives the length of the intestines of the Sea Otter as twelve times that of the animal; but those of the Common Otter as only three times and a quarter the length of the animal. (Phil. Trans.) Professor Owen however informs us that in a female common otter dissected by him, the intestines were 9 feet 6 inches, the body from nose to vent being 1 foot 5 inches; and we should expect, physiologically, to find longer intestines in a common otter than in one of the land Ferre.

Urinary and Genital Organs.—The kidney is lobulated or conglomerate, consisting, in fact, of an aggregation of small kidneys, connected by cellular substance; but these small kidneys are not so numerous as in the seal and porpoise. (Home on the 'Sea Otter.' Phil. Trans.) In the Museum of the Royal College of Surgeons (Physiological Series, No. 2519) is a preparation exhibiting the testes, penis, anus, and anal glands of the Common Otter.

Nervous System and Senses.— Taste, smell, and hearing appear to be well developed. Sight remarkably quick. Touch moderate, except about the muzzle, lips, and whiskers, where it appears to be acute.

Generic Character. [Lutra.] —Head compressed; eyes rather large; ears very short; whiskers very stiff; tongue rather rough; body very much lengthened; legs short; the feet with five toes and webbed; tail long, stout, flattened horizontally, and covered with short hair.

Dental Formula:—Incisors 6; canines 1-1; molars 5–5 = 36.

European Lutra. Example.—Lutra vulgaris, Erxleb. Mustela Lutra, Linn. Description.—Head and nose broad and flat, neck thick, body elongated. Tail broad at the base, compressed horizontally, and tapering to a point.

The eyes, which are not large, are placed comparatively near to the nose. The ears are very short and the auditory opening rather narrow. The mouth is small and the lips are capable of being firmly closed together. The whiskers are very long, the legs very short, strong, stout, and muscular. The five-toed feet are furnished with strong broad webs, like those of water-fowl which have these accessoires best developed. Hence Somerville terms the Otter 'goose-footed.'

Colours.—Brown (deepest on the upper parts), with the exception of some small patches of white on the lips, one on each side of the nose.

Size.—This species varies much in size. The length of one sent to Mr. Bell from Sutherlandshire was two feet one inch and six lines. Mr. Macgillivray notes the length of two males; one measured 42 inches, and the other 32 inches. By the same author, the length of a female is given at 40 inches. These measurements are from the nose to the point of the tail. Mr. Bell states that the usual weight of a fine male English Otter is from 20 to 24 pounds, and that of the female about 4 pounds less; adding however that Pennant records one found, in 1794, in the river Lea between Stratford and Ware that weighed 40 pounds. This, there can be little doubt, is the ispopec (Enhydris) of Aristotle and the Greeks, and the Lutra of the ancient Italians. It is in the modern Italians; Nutria and Lutra of the Spanish; Loutre of the French; Otter and Fisch Otter of the Germans; Otter of the Dutch; Otter of the Swedes; Odor of the Danes; Dyfr of the Welsh; Balgari, Cat-deum (Brown Dog), and Matados of the Northern Celts; and Otter of the modern British.

Habits, Food, Reproduction, &c.—The natural food of the Common Otter is fish, for the chase and capture of which its whole frame is beautifully adapted. How silently it is the water entered! The eyes are so placed that whether the animal is swimming below its prey, behind it, above it, or beside it, their situation, or, at most, the least motion of the head and neck, brings it within the sphere of the pursuer's vision. The whole frame-work of the animal, its short fin-like legs, oar feet, and rudder of a tail enable it to make the swiftest turns, say, almost bounds in the water, according as the rapidity of its agile prey.
stands a sudden downward dive, an upward spring, or a side snap. The short fur, which is close and fine, keeps the body at a proper temperature, and the longer and outer hairs directed backwards enable it to glide through the water, when propelled horizontally by its webbed feet beneath the surface, noiselessly and swiftly. In its motions, there are few objects more attractive in menaces than the pond, especially if it be kept clean and supplied with clear water, wherein the Otter is seen to bus its living prey. When it has seized a small fish, it makes a sudden dash, as recommended. * It clutches the head, whilst the body is held between the fore-paws. Larger fish are held down by the paws, and the head and tail are often left uncast. The havoc made by these animals in fresh water is great; for they go about feeding, and eat but a small portion of each fish, if it be large, when they find plenty of prey. When fish are scarce and it is pressed by hunger, Mr. Bell states that the Otter has been known to resort far inland, to the neighbourhood of the farm-yard, and attack lambs, sucking-pigs, and poultry. Mr. Macgillivray tells us, also, that it has been known to attack young domestic animals, and the latter zoologist found the stomach of one, which was killed in June, filled with a curious collection of larvae and earth-worms. The perhaps the Otter saw one in its travels, and the habit of young produced varies from three to five. The Otter's places of refuge near rivers and lakes are beneath the roots of trees or in holes.

But it must not be supposed that the Common Otter is, as its name would indicate, confined to the fresh-waters. They are known to frequent the sea in the north of Scotland and are often seen far out. In the south of England (Cornwall) the Otter will go a mile from the shore in the summer and good weather, according to Mr. Couper, to the sea-shore, roosting in holes, in caves under large stones, etc. These marine common otters must not be confounded with the Sea Otter (Enhydra). *

The Common Otter is capable of domestication and taming. We have ample testimony. Albertus Magnus, Aldrovandus, Gesner, and others attest this. Every Mr. Fiscator is anxious to possess himself of one of the young, or at least has hunted, killed, and roasted, the 'badder,' bad food. "Look you," says the huntsman, 'here about it was kennelled; look you, here it was indeed, here for her young ones, no less than four; come, let's kill them all." No," exclames Fiscator, "I pray, Sir, save them, and the consequences of this will be the appearance of an ingenious gentleman in Leicestershire, Mr. Nich. Seagrave, has done; who hath not only made her tame, but to catch fish, and do many other things at pleasure." Buffon, who could be as hard of belief as some points as hard as sutil of opinion, in this instance, has lent to the suppliants of the said Buffon, that the fact is true, and that the story is 100 percent authentic. The testimony above noticed has been confirmed by a cloud of modern witnesses. Goldsmith mentions an otter which went into a gentleman's pond at the word of command, drove that fish in a corner, and having seized on the largest, brought it out of the water to its master. Daniel, Bewick, Shaw, record instances of the animal's docility in this way. Mr. Bell and Mr. Macgillivray both corroborate the fact. The latter has collected the following anecdotes. Mr. D'Aimard, in his amusing "Sketches from Nature," gives an account of several domesticated otters, one of which, belonging to a poor widow, when led forth, plunged into the Urr or the neighbouring burn, and brought out all the fish it could find. Another of these spotted with bright red—"a beast of good colour"—fondled about her keeper's feet like a pup or kitten, and even seemed inclined to salute her cheek, when permitted to carry her freedoms so far. A third, belonging to Mr. Monteith of Carstairs, was also very tame. It describes it at some length and with much veneration in his fourth book (Chace) towards the end. It is now fast dying away; but is still kept up in some places, as in Wales and Scotland. The pretty vignette at the close of Mr. Bell's Chace gives a very interesting history of the Otters in the Prince's moras of a day's sport in Glamorganshire not long ago. Mr. Macgillivray informs us that Mr. Lomare hunted the Dumfrsness river in 1833, 1834, and 1835, and that

As an article of food, though the flesh is rank and fishy, the otter was not rejected by the Roman Catholics. Their church permitted it to be eaten on maugre days; and Pen- pheen, a part of the Catholic Church near Dygon, under preparation for the dinner of the religious out at rigid order, who, by their rules, are prohibited during their whole lives from eating flesh. Mr. Macgillivray states that he knew a man in Harris who procured a considerable number of them every year, when they were young, and kept them for his purposes; and who generally cooked the flesh, of which Mr. Macgillivray once partook with the family. It was 'dark-coloured, rank, sapid enough, but not agreeably so;' and under the skin was a layer of fat, as in the seals, which might, he added, render it pleasant food to a Greenlander or staving Hebridian.

Varieties. — Before we refer to the undoubted varieties of this species, it is necessary to notice an Irish Otter, which seems to have been placed among the rank of a species under the name of Lutra Rotensis, on account of the intensity of its colouring, which approaches nearly to black both on the upper and under surface; of the less extent of the pale colour beneath the throat, as compared with the English Lutra vulgaris; and of some difference of the ears, and in the proportions of other parts. The marine habits of the animal, which is found chiefly in hollows and coves formed by scattered masses of the basaltic columns on the east coast of Antrim, where a price is set upon its head in consequence of the fact that a very scarce and valuable Anderson, has been confirmed by Mr. Ogiby in this opinion, from which Mr. Bell differs, observing that Mr. Ogiby states that he had not had an opportunity of comparing it with the Common Otter, that he (Mr. Bell) does not find in the stuffed specimens presented by Mr. Ogiby the same colour for the under surface, and in the belief that it is more than a very dark and handsome variety, and that two skins of Zetland otters (which are equally marine in their habits) presented to him (Mr. Bell) are almost as dark-coloured; Mr. Bell adds that these skins are darker than those usually found in England; and that the fur is nearly as fine as those imported from America.

The variety spotted with white is supposed to be the * king of the Otters * of the Scotch vulgar, who hold that it bears a sort of charmed life, in so far that its death is never unaccompanied by the death of a man or some other living creature. The skin is considered precious as an antidote against infection, wounds, and the dangers of the sea. One of these must not be taken alive, as it is said that all its place it was found. Mr. Macgillivray says that he has heard of white otters, but had never seen an albino.

Chace. — In the older annals of sporting in this country, otter-hunting holds no considerable place. Somerville and Goldsmith describe it at some length and with much veneration in his fourth book (Chace) towards the end. It is now fast dying away; but is still kept up in some places, as in Wales and Scotland. The pretty vignette at the close of Mr. Bell's Chace gives a very interesting history of the Otters in the Prince's moras of a day's sport in Glamorganshire not long ago. Mr. Macgillivray informs us that Mr. Lomare hunted the Dumfrsness river in 1833, 1834, and 1835, and that

* See Goldsmith.< ref name="*"

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Lord John Scott keeps a pack of otter-hounds for the streams of Roxburghshire.

**Geographical Distribution.**—Europe generally.

**Lutra vulgaris.**

**Ariatic Lutra.**

**Example, Lutra Noir.**

**Description.**—For deep chestnut, lightest on the sides; lower part of the neck and cheeks, as well as the throat, reddish bright brown; above the eye a ruddy yellow or yellowish-white spot.

This is the *Nainayse* of the people of Pondicherry, and is probably the species seen by Bishop Heber, who passed a row of nine or ten large and very beautiful otters, tethered with straw collars and long strings to bamboo stakes on the banks of the Matta Colly. 'Some were swimming about at the full extent of their strings, or lying half in and half out of the water; others were rolling themselves in the sun on the sandy bank, uttering a shrill whistling noise as if in play.' I was told that most of the fishermen in this neighbourhood kept one or more of these animals, who were almost as tame as dogs, and of great use in fishing; sometimes driving the shoals into the nets, sometimes bringing out the larger fish with their teeth.' Another proof, if any were wanting, of the feasibility of taming these animals and rendering them useful to man.

**Geographical Distribution.**—East Indies. N.B. Colonel Sykes notes, in his list of *Mammalia* obtained in Dhuken (Dacca). *Lutra Noir, F. Cuv., Juhl Marjur or Water Cat of theMahrratts. The Otter of Dhuken differs only from the *Lutra* in wanting the white spots over the eyes, in having a white upper lip, and in being somewhat larger.' (Zool. Proc., 1830–31).

**African Lutra.**

**Example, Lutra Copernica (genus Aonyx of Lesson).**

**Description.**—For soft, full, and thick, chestnut brown, deepest on the rump, limbs, and tail, brighter on the sides, and brownish-grey upon the head; under part of the body white. Length two feet ten inches from the muzzle to the tail, which is one foot eight inches.

**Observations.**—M. Lesson allows that this species, which he has elevated to the rank of a genus, possesses the same general characters as the *Lutra*, such as the dentary system and form of the body; and makes the difference solely consist in the form of the feet and toes, which he says are hardly joined by a membrane. He states that the second toe would seem conjoined to the third throughout its first articulation. These toes are both more elongated than the succeeding ones, and all the toes are without claws, or rather, a vestige of a rudimentary nail is only observed on the second and third toes of the posterior feet. He records the species as *Aonyx Delaunayi*, Lutra insignis of G. Cuv. and F. Cuv., Dict. Sci. Nat. But Currier, in his last edition of the 'Régne Animal,' writing on the Cape Otter (*Lutra Copernica*, F. Cuv.), remarks that the white of the throat, the sides of the head, and of the neck is more pure than that of the Javanese Simung (*Lutra Leptonyx*, Horsf.), and that there is some of this colour at the end of the nose; but, he adds, what most distinguishes it is that (at a certain age at least) it has no nails, a character on which M. Lesson established his genus *Aonyx*. Nevertheless, continues Cuvier in conclusion, young individuals have been brought from the Cape which have nails, and it remains to be proved whether these are of the same species.

**Locality, Habitat, Food, &c.**—This species haunts the salt pools of the seashores of the Cape, and lives on fish and crustaceans.

**American Lutra.**

**Examples, Lutra Canadenisis and Lutra Brasilienesis.**

**Lutra Canadenisis, Sabine.**

**Description.**—For above and below shining brown, and much resembling that of the beaver. Size much larger than that of the European Otter, *Lutra vulgaris*. Length from nose to tip of tail (which is eighteen inches) about five feet.

This is the *Loutre de Canada of Buffon, Land Otter of Warden, Common Otter of Pennant (Arct. Zool.); Lutra Brasilienesis of Harlan; the American Otter of Godman, Neekhefr of the Cree Indians; and Capuccoa of the inhabitants of Nootka.

Dr. Richardson, who gives these synonyms, states succinctly the various opinions of authors as to this species, and concludes by following Mr. Sabine's opinion that it is peculiar to the northern districts of America.

**Habitat, Food, &c.**—In its habitat and food Mr. Richardson states that the Canada otter resembles the European species. In the winter season it frequents rapids and falls for the advantage of open water; and when the ice melts, it is not unusual for it to travel the great distance through the snow in search of a rapid that has resisted the frost. When seen and pursued by the hunters as it is on these journeys, it throws itself forward on its belly and slides through the snow with lightning rapidity for several yards, leaving a deep show behind it. This movement is described by the Doctor as being repeated with so much rapidity, that even a swift runner on snow-shoes has much trouble in overtaking it. It also doubles on its track with much cunning, and dives under the snow to elude its pursuer. When closely pressed, it will turn and defend itself obstinately. When Dr. Richardson's party were at Great Bear Lake, in the spring of 1826, there otters robbed their nets which had been set under the ice a few yards from a piece of open water. They swam to the head of the heads of the fish, leaving the bodies sticking in the net.

The female brings forth one litter in the year, consisting of two or three.

**Geographical Distribution.**—The Mackenzie and other rivers leading to the Arctic Sea; and Dr. Richardson adds, that there appears to be no difference between the skins obtained on the shores of the Pacific and those in the neighbourhood of Hudson's Bay. (Fauna Boreali-Americana.)

**Utility of the Animal.**—The fur is valuable, and a considerable article of commerce; it varies with the season. In summer the hair is very short, and then it is almost black; in winter it becomes a rich reddish brown, with the exception of the greyish spot under the chin. The fur is nearly as fine as that of the mink, but not so long, and more valued, being more well adapted for felt. Dr. Richardson says that seven or eight thousand are annually exported to England.

**Lutra Brasilienesis, Ray.**

**Description.**—For short and close, of a bright ruddy yellow, deepening into chestnut towards the extremity of the limbs and tail; lower part of the neck and throat pale yellow. Length, male, 3 feet 6 inches; tail, which is very thick, 18 inches. The largest female possessed by D'Azara was 34 inches long including the tail, which was 12 inches long. The animal measured 36 inches, and a considerable article of commerce; it varies with the season. In summer the hair is very short, and then it is almost black; in winter it becomes a rich reddish brown, with the exception of the greyish spot under the chin. The fur is nearly as fine as that of the mink, but not so long, and more valued, being more well adapted for felt. Dr. Richardson says that seven or eight thousand are annually exported to England.

**Habitat, Food, Reproduction, &c.**—D'Azara says that the species is common in tropics, which sometimes leave the surface of the water, lift their heads and bark like dogs, with a boarse voice, in a menacing and snapping manner, without however injuring voyagers or swimmers. Each family seems to possess a separate domain. It spends nearly as much time in the water as it does upon land, which is no disadvantage for the fish which it devours the fish which it

**The same author**
was inhabited by the Payaguan Indians, who sail continually up and down the river, and are better acquainted with this animal than others, that the female brings forth two at a birth, covered with hair, and that many females bring forth and rear their young at the same time in the same place, as their usual resort throughout the year. The motions of this otter are generally slow, and it drags, as it were, its belly and muzzle along the ground: when it runs, it is not all swift.

Dr. Fleming gives the following generic character of the Sea-Otter under the above name. Six incisors above, and five below. Tail much shorter than the body. No anal scent.

Ob. In Cook's 'Voyage' it is stated that a young Sea-Otter was brought on board with six lower incisors. Steller and succeeding systematists give four as the number in the lower jaw. Dr. Richardson suggests that two of the lower ones may drop off, and two of the upper ones may come."

Description. - Fur thick, woolly, and very soft, with the addition of a few silky hairs of a lustrous black; most of the upper parts are of a deep velvety maroon brown, and the anterior parts silvery grey. Body elongated; tail short and stout; hinder feet very short.

This is the Sea-Bearer of Krasseninnikoff; the Sea-Otter of Cook, Pennant, Meares, Menzies, and Godman; the Kulam of the Kamchadaleans; Musela lutris of Lin- nor; Lutra marina of Steller, Erxleben, and Horsfin; Loure du Kamtchatka of the French; Enhydra marina of Fleming. (Richardson.)

Captain Cook, in his last voyage (chapter on King George's Sound, Nootka) says, "It might have been sufficient to have mentioned that this animal (the sea-otter) abounds here, as it is fully described in different books, taken from the accounts of the Russian adventurers in their expeditions eastward from Kamchatka, if there had not been a small discrepancy in the size, colour, and fineness of the fur; till a short while before our departure, when a whole one, that had been just killed, was parted from some strangers who came to Canton; and J. J. the Mr. Webber made a drawing. It was rather young, weighing only twenty-five pounds; of a shining or glossy black colour; but many of the hairs being tinged with white, gave it a greyish cast at first sight. The face, throat, and breast were of a yellowish white or very light brown colour, which in many of the skins extended the whole length of the belly. It had six cutting teeth in each jaw; two of those of the lower jaw being very minute, and placed without, at the base of the two middle ones. In these circumstances it seems to disagree with those found by the Russians; and also in not having the outer toes of the hind feet skirted by a membrane. These seemed also to be a greater variety in the colour of the skins than is mentioned by the describers of the Russian Sea-Otters. These changes of colour certainly take place at the different gradations of life. The very young ones had brown hair, which was coarse, with very little fur underneath; but those of the size of the entire animal which came into our possession, and just described, had a considerable quantity of that substance, and both in that colour and state the Sea-Otters seem to remain till they have attained their full growth. After that they lose the black colour, and assume a deep brown or sooty colour; but have then a greater quantity of very fine fur, and scarcely any long hairs. Others, which are suspected to be still older, were of a chestnut brown; and a few skins were seen that had even acquired a perfectly yellow colour. The fur of these animals, as mentioned in the Russian accounts, is certainly softer and finer than that of any others we know of; and therefore the discovery of this part of the continent of North America, where so valuable an article of commerce may be met with, cannot be a matter of indifference."

Habits, Food, Reproduction, &c. - The sea-otter haunts sea-washed rocks, lives mostly in the water, and approximates to the seals more than to the otters in its habits. The forms for passing from one part of the general marine habits of the animal, it has been occasionally seen very far from the shore.

Geographical Distribution. - The North Pacific, from Kamchatka to the Yellow Sea on the Asiatic side, and from Alaska to California on the American coast. (Richardson.)

Utility to Man. - The fur was eagerly sought after, and is still prized, but not so highly as formerly. Coxe quotes Pallas for the fact that the old and middle-aged sea-otter skins were sold at Kuchka by the Russians to the Chinese, at from 80 to 100 roubles a skin, or from 16l. to 20l. each. Dr. Richardson observes that the trade was for a considerable period in the hands of the Russians, who, soon after the discovery of the north-west coast of America by Bering and Tschirkow, sent mercantile expeditions there. The passage above quoted from Captain Cook's 'Third Voyage' drew the attention of the English, and both private merchants and the India Company sent vessels to collect skins on the American coast and transport them to Canton. Pen-

Sea-otter.
Place in the System.—Linnæus placed the Otters among the Weasels, as species of the genus Mustela; and modern authors generally have assigned to the form a place among the Mustelidae.

In Illiger's system we find Lutra in his family Crocidura (in company with Herpestes, Mephitis, and Mustela), the fourth of his order Falcata.

Cuvier places the family in the order Carnivora, under the genus Mephitis (subgenus Mydus) and Canis.

Mr. Gray arranges Lutra, together with Putorius, &c., under his subfamily Mustelina, the third of his family Felidae. Enhydra of Fleming (which that zoologist had confused with Lutra, in his genera of Carnivora, so as to unite them to the Seals) forms the subfamily Enhydrina of Gray (which is situated between Phocina and Oturina), being the third of Mr. Gray's family Phocidae.

Fischer (J.B.) places Lutra between Mustela and Enhydra, which last is immediately succeeded by Phoca.

Lesson follows Cuvier and Geoffroy.

Mr. Swainson arranges Lutra (with Enhydra as a subgenus) between Mydus and Gulo, in his subfamily Mustelina, family Mustelidae. He considers that the otters, although intimately connected with the polecats, clearly form the aquatic type of the Mustelinae, and as such represent the seals.

Mr. Bell keeps Lutra in the family Mustelidea, and in Mr. Waterman's British Quadrupeds the genus stands next to the martens.

FOSSIL OTTERS.

Jaeger notices the remains of a Lutra in the Bone iron-ore (Babenzer) of the Rauh Alp (tertiary); and M.M. de Serres, Dubreuil, and Jean-Jean record an extinct species (Lutra antiqua) in the bone-ravens of Lunel-Viel. The form was also detected in the Puy-de-Dôme by M.M. Croizet and Jobeau.

OTTER-HOUND, a variety of hound employed in the chase of the otter. As it is necessary that otter-hounds should not only have good noses, but take the water freely, some care is necessary in attending to the breed, if a good pack is to be obtained. Mr. Davie observes a cross between the harrier and terrier. [Otter.]

OTTERY ST. MARY. [Devonshire.]

OTTOMAN EMPIRE. [Turkey.]

OTUS. The Cuvier's name for a genus of Horned Owls. [Strigidae.]

OTWAY, THOMAS, an eminent English dramatist, was born at Trotton, in Sussex, March 3rd, 1651. He received his education at Winchester school, and was entered as a commoner of St.Wilfrid's, Oxford. He left the University without a degree, he went to London, where he commenced player, but met with little success on the stage. The fame which was denied to him as an actor he endeavoured to obtain as an author, and in 1675 he published his first tragedy, 'Titus and Berenice,' and the 'Cheats of Scapin' were published in 1677, the first of which was translated from Rapin, and the latter from Holmæ. 'Friendship in Fashion' was published during the following year.

Otway's wit procured for him the patronage of the earl of Plymouth, and a becamey was obtained for him by this nobleman in the army of Flanders. Not finding the military life agreeable, he gave up his commission, and returned to London, where, being in extreme poverty, he again began to work for the stage. 'The Orphan,' one of the two most pleasing of all his plays, was performed in 1688, and was also the 'History and Fall of Cumaus Maris.' In 1691 appeared the first part of a comedy called the 'Soldier's Fortune,' which was well received, and the second part under the title of 'The Atheist,' in 1694. The greatest of all his dramatic efforts however was his last, 'Venice Preserved,' which was exhibited in 1692, and which still keeps possession of the stage. Its character is altogether of a higher order of parts, and its accessaries. Besides the works that have been mentioned, Otway was the author of various translations and numerous miscellaneous poems. An edition of his whole works was published in 3 vols. 12mo., in 1757; and another in 4 vols. 8vo., in 1813. His writings, although so numerous, did not secure him from the miseries of indigence; and one of the accounts of his death, which are various, represents it as having been occasioned by his poverty. He died April 1st, 1685, before his play had reached its 34th year. As an author, he shows great terseness and command over the gentler feelings, and an exact knowledge of human nature. Passages of considerable power also are of frequent occurrence in his writings, which however are disfigured by a prevalent grossness and immorality. (Works, Lond., 1757, 3 vols. 12mo.; Lond. 1813, 4 vols. 8vo.]

OUDÉ. [Hindustan, vol. xii, p. 218.]

OUDENAARDE, commonly called Oudenarde, is a small town, situated at the mouth of the East Flasders, 15 miles south-west from Ghent, on the right bank of the Schelde, in 50° 31' N. lat. and 3° 35' E. long. The town is a place of great trade. It is the centre of a district in which the linen manufacture is carried on, and is noted in the market in which the produced are sold: it contains several tanneries, breweries, salt-refineries, works for drying and bleaching, some cotton-mills, oil-mills, and various other manufacturing establishments. The town contains 790 houses and 3407 inhabitants, it has three churches, town-hall, an hospital, two orphan-houses, 17 schools, and a college. There is besides, a school, opened in 1833, in which 150 boys and an equal number of girls are taught gratuitously. There is also an industrial school for poor girls, in which they are taught to sew and to knit, which contains about 100 children.

The houses are generally well-built. The town is of great antiquity, but the date of its origin is quite unknown. It is believed that the Romans made it a station of great importance, which is corroborated by the discovery of Roman medals and coins which have from time to time been discovered on the spot. In one part of the town, where the remains of some very old buildings are to be seen, there were found statues of Domitian, Antoninus Pius, Marcus Aurelius, Patroclus, and Commodus. On the other hand, date the origin of the town from the beginning of the fifth century. The prosperity of Oudenarde dates from the time of Philip of Alsace, count of Flanders, who resided there in 1260, and who gave greater magnificence to the town.

A great battle took place before this town in 1708, between the French, commanded by the Duke of Burgundy, and the allies under Marlborough and Prince Eugene, in which the latter gained a complete victory.

Oughtred, William, an English divine and mathematician, was born at Eton, in Buckinghamshire, in 1575. He was educated at Magdalen College, Oxford, and graduated B.A. in 1592, and was elected thence, in 1592, to King's College, Cambridge, of which, in regular course, he became a Fellow. While he was an undergraduate he invented the species of the 'geometrical disling,' but which was given to the public before the year 1647. He proceeded to the degree of B.A. in the year 1596, and that of M.A. in 1599. In the year 1603 or thereabouts, Oughtred was ordained priest, and presented to the rectory of Aldbury near Guildford in Surrey, upon which appointment he quit the University and resided upon his living, distinguishing himself by the faithful and diligent discharge of his pastoral duties. In 1628 he was engaged by the earl of Arundel to become tutor to his son, Lord William Howard, and was given a pension, by whose patronage he obtained a distinguished position in the history of its progress during the seventeenth century. But notwithstanding his high station in the scientific world (and Fuller says that he was 'unanimously acknowledged the prince of mathematicians,' he was in danger, in the year 1644, by the opposition of a committee for plundered ministers, several articles having been depoed and sworn against him, material enough, it is said, to have suerested him. But upon his day of hpearage, as it is called, the day of his 70th birthday, his friends, especially Bulstrode Whitlocke and all his old friends, who appeared in such numbers on his behalf, that he was acquitted by the majority. Oughtred sometimes amused himself with art; he was sprightly and active at the age of eighty, and, if we may believe Mr. Collier, died in an asylum in a state of joy upon hearing of the restoration of Charles II. Fuller (Worthees, i. 143) says that 'this aged Simeon had a strong persuasion that before his death he should behold Christ's anointed restored to the throne, which he did accordingly to
his incredible joy, and then had his dimittis out of this mortal life, Jan. 30th, 1660." Evelyn, in his 'Diary' of 17th August, 1653, mentions meeting with Mr. Oughtred, the "famous mathematician," which shows that his fame was already established.

The following is a list of his principal works:
1. 'Arithmetica in Numero Speculativum Institution; quae tum Logistica, tum Analytica, atque adeo totius Mathematicae quas eis,' 12mo., 1631.
2. 'The Mathes, as if he had answered to all questions, and an English translation of it was made by Christopher Wren, and published under the title of 'The Key of the Mathematices now forged and fled.' It was introduced by Seth Ward as a text-book at Cambridge. The book was much complained of on account of its style, but Dr. Wallis says: 'without cause, for his words be always full, but not redundant,' and Dr. Pell, in a letter to Cavendish preserved in M's. Hart, Mus. Brit., 6796, bears witness to the same effect.
3. 'The Description and Use of the Double Horizontal Dial, whereby not only the bowers of the day be shewn, but also the meridian line is found; and most astronomical questions which may be done by the globe are resolved,' 12mo., 1656.
This edition appeared in 1652.
4. 'A Treatise on Trigonometry,' 4to., 1677.
This book was afterwards published in Latin, in 1667, by Stokes and Haughton.

We refer for more particulars concerning Oughtred to Astle's 'Mathematics,' vol. ii. pp. 422. Many of his papers are now in the valuable library of the Earl of Macclesfield.

OUISTITI. [Jacques]

OUDE. [POOD.

OONDE. [NORTHAMPTONSHIRE.

OURAX. [CRACIE, vol. viii., p. 129.]

OURB. [ANTHELSE, vol. ii., p. 76.]

OUR. [OON.

OUTLAWRY. This term, which is derived from the Saxon Ulliagh or Ulliagh, signifies an exclusion from the benefits and protection of the law. In English law it is a punishment consequent upon a flight from justice, or on being outlawed, whether as a criminal or as a civil officer. The term is derived from the old French 'outlaw,' from which it has been corrupted. In the time of Henry I., and it has been used to denote the condition of a person who has been outlawed or a wolf.' The 'Mirror' is a book of doubtful antiquity and authority, and this story of the reward for the heads of outlaws is probably fabulous, or at all events an exaggeration of the fact. However, it was not until the end of the reign of Henry III., and therefore more than a century after the Conquest, that is outlawed is a punishment.

The Conquest, as a result of the Conquest, declares that an outlaw 'might be killed by all, especially if he defended himself or ran away, so that it was difficult to take him; but when once taken, his life and death were in the king's hands, and any man then killed him, he must answer for it in the case of any other homicide. (Bracton, lib. iii., cap. 13). That this practice and law prevailed in his time is further proved by another passage in Bracton (lib. iii., c. 14), in which he says that a man who has been outlawed, before he can take his property, or restored to his law by a pardon from the king, should take care always to 'carry his pardon about with him wheresoever he may go, and have it ready in his hand to show, lest a peradventure somebody should say that he has obtained the king's grace, should slay him as an outlaw.' (Fleta, who wrote rather later than Bracton, mentions the same law, and justifies it: 'Ulitagius et davitius capita gerunt lupina, quas ab omnibus impunis poterunt amputari; merito enim sine legere debent qui secundum legem vivere reussar,' (Fleta, lib. i., cap. 27.) Lord Coke says, 'In the beginning of the reign of Edward III., it was resolved by the judges, for the benefit of the king and effusion of Christian blood, that it should not be lawful for any man to kill an outlaw, though he were for felony; and if he did, he should undergo such punishments and pain of death as to other cases, and so it has continued to this day, and thenceforth the law continued until this day.' (Co. Lit., 128b.) For this fact he refers to the 'Year Book,' 2 Ass., pl. 3. The 'Year Book' however, as cited, and another report of the same case in Fitzherbert's 'Abridgement,' tit. Corone, 145th, although it is not certain that the same case is referred to, is very consilient that Lord Coke derived the above statement, is clearly an authority to show the continuance of the old practice. A man being arraigned for homicide objects to answer because the person charged, whose death he was charged had been outlawed for felony. The judges at first certainly appeared to think that it was not lawful for any one to kill an outlaw unless it were upon his resisting a bailiff who should attempt to arrest him. But after argument, they said: 'The law in such case is this; and of the deceased had a charter of pardon, and search their own rolls to see if his outlawry has been reversed,' and they admitted the prisoner to bail in the mean time, telling him that if they found that there had been no pardon and no reversal of the outlawry, he should not be granted a new trial. This case therefore seems to show that Lord Coke prematurely claimed for the judges in the reign of Edward III., the merit of abolishing this barbarous practice; indeed so late as the reign of Philip and Mary, Staundforde, in his 'Plea of the Law' claims the same right. And the practice of outlawry is, in the technical sense, punishable with imprisonment or being kept in the common gaol, and is a punishable offence.

The consequences of outlawry are the forfeiture of goods and chattels universally. Where it takes place upon a prosecution for treason or felony, it amounts to a conviction and the punishment of the accused, and therefore all the outlaw's real property, as well as his person, is forfeited. Where it takes place upon criminal prosecutions for misdeemors, or upon civil actions, the profits only of the defendant's lands are, during his life, forfeited to the king.

The Consequences of outlawry being so highly penal, the law has at all times been careful that no person shall be outlawed without sufficient notice of the process of the court, and without satisfactory proof of his contumacy. It is therefore required, in the first place, that in all civil cases, and in all indictments for misdeemors, and probably also for felonies not capital, three consecutive writs of capias, each issuing upon the return of the former one, should be directed to the sheriff of the county in which the proceeding commences. If upon all these writs the return is non est inventus, a writ of exierit or exierit facias is sued out, which requires the sheriff to cause the defendant to be called or exacted in five successive counties, or in five successive bounties, if he cannot be found, as a person who is alleged to be an outlaw.

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The only difference between the proceedings in outlawry
upon an indictment of treason or capital felony and those
upon civil actions and pro-ecclesiastics for inferior crimes, is
that one capias is in the former case sufficient before the
award of the exigent.
An outlawry may be reversed by writ of error, in which
the party may avail himself of errors of either law or fact;
and the slightest mistake in any part of the proceedings
will avoid the outlawry. It was formerly necessary to pro-
cure a pardon from the Crown, by which the outlaw and
all persons share in the same relief as to debtors and felons,
at least to be compelled to become servile tenants, and to
these purposes 'inлагатус'. In modern times it is the usual course for
the courts to reverse outlawries upon motion, without obliging
the parties to sue out writs of error or procure pardons, and
by this means the jurisdiction and expense saved.

OVATION [THOMPSON]
OVERBURY, SIR THOMAS. [JAMES 1.]
OVERSEER, an officer appointed by justices of coun-
ties or boroughs, for parishes under the 45 Eliz., c. 2, and for
townships under the 12 St. Il., c. 11, 12. They cannot be
less than two nor more than four for one parish or township.
Churchwardens are ex-officio overseers of the poor. The
duties of an overseer and of an assistant-overseer are iden-
tical, the latter being a paid officer, appointed under the 59
Geo. 2, c. 26, to collect taxes. Of the amount of the popu-
lation, the extent of the parish, or other difficulties, the
services are onerous and troublesome. Before the passing of
the Poor-Law Amendment Act, it was the business of an
overseer as well to appropriate and distribute as to make
out the returns of poverty and other necessary particulars.
It has, however, been ordered, that he judge of the neces-
sity of applicants for and receivers of parochial relief, an appeal in case of refusal
lying before magistrates in petty sessions. For an account
of the abuses which arose from this, see the senate's c. 11
of the same year, article Poor-Law. We
shall now describe the present duties of an overseer in parishes
subjected to the operation of the Poor-Law Amendment Act: 1. Relating to the management of the poor and to the
boards of guardians, the duties of the overseer are given in the
return of magistrates and jury lists; 3. With reference to
the registration of voters.

1. The Poor-Law Amendment Act limited the authority
of an overseer of the poor, by transferring to a board of
guardians the collection of the 12 St. Il., c. 11, 12. Their duties
being fit objects for parochial relief, the amount of relief to
be given, and the manner of giving it. With such services he
has now little to do. His first business on entering upon
his office is to possess himself as soon as he is able of the
parochial debts and particulars, in order to render the accounts
under which money is payable; to collect outstanding arrears,
if any; and to settle the balance with the outgoing overseer.
He will probably be soon called upon to levy a rate, which
must be made by a majority of parish-owners residing in the
parish. On refusal to pay the rate the summon will be granted against the defaultor by
a magistrate. An appeal may be carried by the rate-payer to
the district petty sessions, on the ground of inequality, un-
reason, or incorrectness, if at all the rate is given, or under the hand of the party
appellant; or to the quarter-sessions, on the ground that the
property is not rateable. It is then the duty of the overseer
to appear before the justices to support the validity of the
rate. He must collect all reports that he is able from the
fathers of bastard children, and keep the weekly payments
from them currently paid up. In cases of refusal to pay,
or other difficulties, he should apply to the Board of Guard-
ians for advice before taking the proceedings justified by
law, and it is only in cases of relief to be given in any
sudden or urgent necessity; and, as soon as he is able, is
to report to the relieving officer his having given such
relief. The relief may not be given in money, but only in
articles of absolute necessity. The orders of the Poor-Law
Commissioners, or of the overseers of the poor, are bound
to be received by a direct order directing relief to be given to any person
(duly certified, under the hand and seal of one of the magis-
turies, to be of his own knowledge wholly unable to work),
without requiring any proof in such particular cases.
When with such people he is able, he shall forthwith transmit the same to the
relieving officer of his township or place, to be laid before the
Board of Guardians at their next meeting.' At the end of each quarter the overseer will receive a notice
from the auditor of the union to attend upon him that his accounts
may be examined and audited. At these times he should
take with him all his parish books, letters, and papers, to
any of which reference may be possibly be made. He is to
manage and collect the rents of parish property; and at the
end of the Michaelmas quarter he should make out a
terrier of the lands and tenements, and an inventory of
stocks, money, goods, and effects belonging to such parishes,
or given or applicable in aid of the poor-rate thereof.
The accounts of overseers must be submitted to two magis-
trates for their examination within fourteen days after the
end of the Michaelmas quarter of the year, and if the guard-
ian or guardians in their district are likewise conducted for
the most part by the overseer. He must distribute and
affix the notices, receive the names of candidates, and, if
there be a contest, circulate voting-papers, receive the vote-
s, and declare the result of the whole set of the surprisal.
In the return of the list of the subscribers, the see of
the Poor-Law Commissioners and the provisions of the 4 & 5 William IV.,
sec. 76. (See clauses 38-41 of the Poor-Law Amendment
Act.)
In cases in which affiliation seems desirable, or respecting
orders of removal from his parish, or notices received of orders of removal to it, the overseer should hear the opinion of the Board of Guardians at their next ensuing meeting.
He will likewise receive instructions, if he is ignorant or
inexperienced, of the forms which must be complied with in such cases.
2. At their first petty-sessions after the 15th of August, the
justices of the district issue their warrants to the overseers
to return lists of all insane persons chargeable in their re-
spective towns or districts. The overseer, in making this
return, as well as, in the case of any insane person be-
coming chargeable, to give notice within seven days to some
magistrate acting for that division of the county. In July
the return will come from the high-court. On the return a
precept, or an order for a full information of his district, for
the return of a list of persons liable to serve on juries. This
return is to be made before the 1st of September.
3. With regard to registration, his business is as follows:
On the 26th of June, in each year, he is to deliver a notify-
door a notice, directing fresh claimants for votes to make
formal claim in writing to the overseer on or before the 20th of July. His next step is to make out for each parish an
alphabetical list of the names of all persons already in the
register, together with those of all claimants. This list must be completed by the last day of July, and affixed on
the church or chapel, and, if there be no church or chapel,
in some conspicuous situation, on the two first Sundays in August. He must give copies of this list for a reasonable
sum to every elector of the parish, and objections to votes may be received. An alphabetical list of objections to be
posted, as before, on the two Sundays next preceding the 15th of September. When the revising barrister holds his court, it will be the duty of the overseer to attend there, and in
cases of objections arrested to be read and by the overseer,
summons will be granted against the defaulters by
a magistrate. An appeal may be carried by the rate-payer to
the district petty sessions, on the ground of inequality, un-
reason, or incorrectness, if at all the rate is given, or under the hand of the party
appellant; or to the quarter-sessions, on the ground that the
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turies, to be of his own knowledge wholly unable to work),
without requiring any proof in such particular cases.
When with such people he is able, he shall forthwith transmit the same to the
relieving officer of his township or place, to be laid before the
Board of Guardians at their next meeting.' At the end of each quarter the overseer will receive a notice
from the auditor of the union to attend upon him that his accounts
may be examined and audited. At these times he should

OVERTURE (Overture, Fr.), a musical composition
for a full instrumental band, introductory to an overture,
concerto, or oratorio; or a prelude, or overture, to a
play, or a play with music. It is not always sought to be in good keeping with the piece which it ushered in; though in most instances but little attention has been paid to the character of this important feature of the medo-
rist's art, it is the characteristic of almost all the pieces however, and it would be unjust to the memory of those most eminent of the ma-
posers not to mention, as instances of deep thought and poetical imagination, the fine overtures to Don Giovanni, The Franchises, and A Midsummer Night's Dream, all of which fully prepare the mind—in so far as inarticulate sounds can prepare it—for the romantic stories and su-
The overy originated with Lully (LULLY), whose compositions supplied many of the early Italian operas with an opening instrumental piece. And indeed the great Handel himself imitated to a certain extent the overtures of the French composer; though in this case, as in every other of the kind, he improved whatever he touched.

OVERY, a province in the kingdom of the Netherlands, is situated between 52° 6' and 53° 52' N. lat. and between 4° 30' and 7° 3' E. long. The area is 1280 square miles, or about that of the county of Gloucestershire. It is bounded on the north by the Rhine, on the south by the Meuse, and on the east by the kingdom of Hanover and the Prussian province of Westphalia, on the north by Guelderland, and on the west by Guelderland and the Zuyder Zee. It is a low level country, clothed in a kind of green cloth, which the inhabitants breed and weave. The soil is wet and marshy, especially in the eastern part, where the peat meows of Echter and Hardenberg extend between Ryssum, Hardenberg, and Ootmarsum. There are likewise several sandy heaths, but near the Yssel there are some sand dunes. The chief river is the Yssel, which runs along the frontier of Guelderland, and is 200 feet in breadth; it is joined at Deventer by the Schapbeek, and falls into the Zuyder Zee below Kampen; other rivers are the Zwarte Water (i.e. Blackwater), the Oude Yssel, and a canal called the Luyk, which unites the Yssel and the Zwarte Water, was opened in 1819. The province contains several small lakes. The climate is moist, and, on account of the extensive marshes, unhealthy. The products are some corn, flax, rye, hemp, hops, and grasses, and pigs. There are several fisheries, and some good salt and lead works, and some mineral springs. The common industries are weaving and tanning.

The city of Deventer is situated on the Yssel, and has 12,000 inhabitants. The chief exports are wool, flax, hemp, and hides. The houses are built of brick, and the streets are narrow and dirty. The cathedral is a large and handsome building, and is dedicated to St. Mary. It is said to be the birthplace of the learned James Gronovius. Thomas Kempis taught and died in this town.

Almelo, on the Vechte, has 2200 inhabitants, among whom there are many Baptists; they manufacture woolens and linens; of the latter, 14,000 pieces are annually exported. Other towns in this province are Enschede, 2600 inhabitants, and its district Lommelke, with 6000 inhabitants; the manufactures of which are worth a million of florins annually. Hasselt, 1500 inhabitants; Steenwijk, 2500 inhabitants; Rome, 1000 inhabitants; Aalten, 2500 inhabitants, both of them flourishing manufacturing towns.

Iliboe, [Ox].

DIYDIUS, CALLIUS NASO, was born at Sulmo in the country of the Peliugi, B.C. 43, the same year in which Cicero was murdered, and on the very day on which the consul Hiritsu and Pansa died. The events of his life are chiefly known from his own writings, and more particularly from the elegy of the 106th of the 'Tristium'. Ovid was an equestrian family. He had a brother exactly twelve months older than himself; the two brothers were sent to Rome for their education at an early age. From his boyhood Ovid was fond of writing verses, and, as he says of himself,

'Sponte sum numerosus carmen venisset ab apto, et quod tentavit scribere versus exultavit.'

His father discouraged his poetical aspirations on the ground that poverty was the condition of poets, and the youth accordingly tried several trades, among them freeman to a dyer, mason, and baker. The two brothers were educated under the care of some of the best teachers then in Rome—Plutus Grippus, whom Quintilian (Insti. Or. ii. 4) considered one of the first teachers of eloquence, Arius Fuscus, the friend of Horace, Messa, and Portius Latinius, friend and patron of Seneca. It has been said that he had seen Ovid practicing declamation before Fuscus. His brother Lucius died after completing his twentieth year, an event which Ovid most affectionately mentions in his 'Fasti', the 1st year, 14th book. Ovid married the daughter of the Consul Cnaeus, who was governor of Asia. The two were sent to Rome for their education at an early age. From his boyhood Ovid was fond of writing verses, and, as he says of himself.

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The province is divided into three districts, those of Zwolle, Almelo, and Deventer, so named after the chief towns. Zwolle, the capital of the province, is a well built town on the Zwarte Water, a short league from the Yssel, and rather farther from the Vechte, with which it has a communication by means of the Willemsveert above mentioned. It is defended by a rampart, which is planted with avenues of trees, and by very strong outworks. It has three gates, leading to as many suburbs, eight churches, a house of correction, and a Latin school. The inhabitants, between its limits, are said to be 19,500. In the town of Almelo are nineteen tanneries, fourteen manufactories of cordage, two paper-manufactories, one of snuff and tobacco, and extensive bleaching-grounds.

Deventer is on the right bank of the Yssel, over which there are several bridges, and which has received the name of the Schapbeek, which runs through the town. It is a fortified town, but the woods have fallen into decay. There are seven churches, the principal of which has some fine paintings on glass. There is a gymnasium and other public institutions in the family of the Van Eeghem. It has a large assembly in the year 2 B.C., the same year in which Augustus banished his daughter Julia. Previous to the 'Ars Amatoria' he had published his three books of Amores, which were originally in five books; and also his Heroides.
At the close of the year A.D. 8, when he had just completed his fiftieth year, he was banished from Rome by Augustus. The sentence was altogether unexpected; it fell on the astonished poet like a thunderbolt. The place of his exile was Tarsus, a Milesian colony (Trist., iii, El. 9) in the country of the Getae, on the banks of the Euxine. Ovid has described in a most touching manner (Trist., i, El. 3) the last night which he spent in Rome, and his internal separation from his wife and friends; his daughter was absent in Libya. His property was not confiscated, but his exile was for life. The cause of the banishment of Ovid is not distinctly stated by himself, nor by any other writer; a circumstance which has led to various conjectures. All of which however are devoid of any historical foundation.

The supposition that Ovid was banished for an amour with the emperor's daughter Julia rests on no evidence, and is incorrect. It is certain that Julia herself was banished ten years before Ovid. He admits (Trist., v. El. 11) that his offence deserved a severer punishment than the emperor inflicted.

His sentence was not Exsilia, but Regelatio; and the difference was not unimportant. Exsilium was followed by loss of fortune and citizenship; Regelatio was not followed by loss of citizenship, and only accompanied with loss of property so far as this loss was comprehended in the sentence of Regelation. The poet himself has expressed this with strict technical accuracy in one of his elegies addressed to his beloved Delia (1. i. El. 13), where he tells us how he was upbraided as being the wife of an exile, insomuch as his sentence was only Regelation:

Nec vidit, nec opes, nec jussi mihi exsilium;
Neque popule cuncta neque effusis illa.
Nec puls mei patria: jussit aut exsilium, aut.

Trist., v. El. 11.

In other passages however (Trist., iii, El. 3, &c.) he calls himself Exsilus, but doubtless in the general sense of that term; for Regelatio was one of the species of which Exsilium was the genus.

He admits (Trist., ii. 207) that there were two charges against him, the character of his amatory verses and some fault (error) which he never mentions. The whole of the second book of the 'Tristia,' which is addressed to Augustus, shows the poet to be in a state of exasperation, in which he erodes his society, in which he erodes technical accuracy in one of his elegies addressed to his beloved Delia (1. i. El. 13), where he tells us how he was upbraided as being the wife of an exile, insomuch as his sentence was only Regelation:

Nec vidit, nec opes, nec jussi mihi exsilium;
Neque popule cuncta neque effusis illa.
Nec puls mei patria: jussit aut exsilium, aut.

Trist., v. El. 11.

In other passages however (Trist., iii, El. 14; iv, El. 1; v, El. 1; Ep. ex Ponta, 1. i, &c.) he refers to his poetry as one cause of his misfortunes. It may be conjectured that he was punished under the provisions of the Julian Law, De Deditis et Pecunia Acidetibus (Dig. 42, tit. v. x.), which was passed about B. C. 17; for though the provisions of this law, as known to us, make no mention of obscene poetry, it is clear from the title of the 'Digest' that the law extended beyond punishing the direct parties to an act of adultery, for it punished, among others, those who lent their houses for adulterous purposes. Ovid himself says, that the two charges brought against him, one should be nameless, but the other was founded on his amatory poetry as encouraging to adultery:

'Altemare superest qua turba crimine tắcere;
Argust obscena docti adulteri.'

Trist., ii. 211.

At the time of his banishment the fifteen books of the 'Metamorphoses' were unfinished (Trist., i, El. 1; ii, 555; iii, El. 14); the poet had burned them, as being incomplete, at the time of his leaving Rome, but there were other copies in existence. The twelve books of the 'Fasti,' of which the first six only were preserved in his own hands, were written before his exile, and, as the poet tells us, inscribed to Augustus Caesar. They were finished during his exile, and, as we now have them, inscribed to Caesar Germanicus.

The works of Ovid written during his banishment are, the five books of the 'Tristia,' and the four books of his 'Letters from Pontus.' The letters are addressed to his wife, to Maximus, Pedo Albinovanus, Graccinius, Rufinus, and others of his friends. The 'Euls' also was written in his banishment, and apparently soon after his arrival at Tarsus. Ovid writes in it the most affecting descriptions of the hardships he endured, and the interest of his friends. Augustus never recalled him from banishment. He died at Tarsus, A. D. 18, in the sixtieth year of his age and the tenth of his banishment. Augustus died four years before him. The circumstance of his not being recalled by Tiberius renders it probable, as has been conjectured, that he had offended the emperors of Nerva and Trajan. The poet, who had enjoyed all the pleasures of a luxurious capital and the society of all his most distinguished contemporaries, spent the last years of his life among a barbarous people and in an inhospitable climate, worn out with grief and mental anxiety. (Ex Ponta, 1. iv, Ep. 4.) His only consolation in exile was to address his wife and absent friends, and his letters were all poetical. The Muse, whose cause was the cause of his calamity, were also his consolation in misfortune. Though the 'Tristia' and the 'Letters from Pontus' have suffered some defect, they have not lost all their exquisite taste and fruitful invention have redeemed them from the imputation of being tedious, and they are read with pleasure and even with sympathy.

It cannot be shown that he wrote a poem during his exile in the Gothic language; the subject was, the praises of Augustus Caesar and his family. The rude barbarians to whom Ovid recited this poem were surprised and delighted: their uncivilised minds acknowledged the power of his art. The MS. in which the poem is copied was written on the occasion of the funeral of some Roman poet. (Ex Ponta, iv, El. 13.)

The works of Ovid form one of the most valuable parts of the literature of Rome. With the exception of the 'Metamorphoses' and the 'Fasti,' all his poems have suffered some defect; the restraint of which would have been ill suited to such long compositions as the 'Fasti,' in the hands of almost any other Roman poet. But Ovid was a perfect master of the technical part of poetry, and it is surprising with what consummate skill he was able to include in a short poem all the parts of a verse full and complete sense. It is rarely necessary to go beyond each pair of verses in order to obtain the meaning of the poet; each couplet is generally complete in itself. And yet the whole of a long poem written in this measure is as skilfully woven together as if it were a faultless unity. It is a necessary consequence however of this restraint, that the elegiac poems of Ovid are sometimes expressed with such an epigrammatic brevity as to be obscure; and the antithesis, which seems to be in some measure inseparable from this kind of measure, and certainly was rather sought after than avoided by the poet, is sometimes too frequent.

If we estimate the character of Ovid by his erotic poetry, we must shrink at it. He is without doubt an unclean poet, and the voluptuous pictures of the sex seem to have been the uppermost thought of his mind, and the tendency of his 'Amores' and 'Ars Amatoria' must be considered injurious to the morals of a people. The 'Remedia Amoris' can hardly be viewed, as some are inclined to do, as a kind of apology for his amatory poetry. If we estimate the character of the poet by that of the licentious age in which he lived, we shall judge him more favourably: though a man of pleasure, he was temperate in eating and drinking, humane, and general benign.

There are no passages in the extant works of Ovid which approach the gross obscenity of many passages in Catullus, Horace, and other Roman writers; and this is a merit, at least viewed as a matter of taste. In a moral point of view his poems may be more dangerous. The voluptuous pictures of Ovid are only covered with a transparent veil; and even this is sometimes withdrawn. It is rather singular that the 'Heroides,' which abound in obscene allusions and voluptuous imagery, and are often difficult to understand, should be so much used by an elementary school in modern times.

The two great works of Ovid are his 'Metamorphoses' and his 'Fasti.' The subject of the 'Metamorphoses' is briefly expressed in the opening of the first book:

Greek mythology of Greece furnished Ovid, as it may still furnish the poet, the painter, and the sculptor, with materials for his art. With exquisite taste, simplicity, and pathos, he has narrated the fabulous traditions of early ages, and given to them that appearance of reality which only a poet in the truest sense of the word, and a man of striking and true; he selects with care that which is appropriate; he rejects the superfluous; and when he has completed his work, it is neither defective nor redundant.
The art of the rostratorian, as well as that of the poet, is perceptible in all the works of Ovid, but particularly in the *Metamorphoses.* The two speeches of Ajax and Ulysses, in the beginning of the thirteenth book, are in their kind as well as others, the most perfect of their kind; one by Odysseus, the other by Ajax, might himself have become an orator, and if he had lived in the age of Hortensius and Cicero, might have shone, as Ulysses did—

quid faciebas poetae.

The *Metamorphoses* are read with pleasure by youth, and are re-read in more advanced age with still greater delight. The poet ventured to predict that his poem would survive him, and be read wherever the Roman name was known.

The *Fasti* of Ovid are in fact a valuable historical movement. He has preserved to us the Roman calendar, with all the antient stories attached to it, collected from the traditions of the people and the old chroniclers and antiquaries. His own explanations may often be of little value, but they are easily separated from the antient story or tradition which he relates. He begins with January, and following the days of the month in order, he assigns to each a particular subject. He lived in Spain, owing to his banishment. It is also not improbable that he intended to convert the Calendar of his country into a pleasing and instructive poem, rich in historical facts, and enlivened and relieved by true poetry. A complete commentary on the *Fasti* would be a valuable commentary on Roman history. Such a work is untried. Ovid wrote also one tragedy at least, the *Medea* (*Tristit.*), which is highly spoken of by Quintilian (Inst. Or., x. 1), and by Tacitus (*De Orat. Dialog.,* 12).

There are various other small poems attributed to him, probably fictions.

The editions of the collected and separate poems of Ovid are numerous. The best edition of his complete works is by Bormann, 4 vols. 4to., Amsterdam, 1727. The French translations of the various poems, which are very numerous, are of the end of the eighteenth century. There are several on Ovid in the *Biographie Universelle.* There are numerous English translations:

The best translation of Ovid into English verse is *Ovid's Metamorphoses,* trans. by Richard F. Emmerson, London, 1717, fol. There have been numerous reprints of this version. The translators were Dryden, Addison, Congreve, Rowe, Gay, Ambrose Philips, Garth, Croxall, and Bewell. Sidney translated the first book, Lond. 1637, 4to.; and, some books small, translated by others. There is a literal prose translation by Clarke, London, 1733, 8vo.; and there is another prose translation, London, 1748. There are many translations of the *Art of Love,* one by Dryden, Congreve, &c., which continued during the reign of Charles the Second, and which were slighted by the public. There are translations in verse or prose, or both, of the *Fasti* and the other works.

It is hardly necessary to state that a translation of Ovid into English can have little value. A great part of having been held there in 901, the hiccup was by the pope elevated into an archbishopric. This dignity however was in the course of time transferred to the church of Santiauo, and Oviedo became a bishopric as before.

Oviedo contains an episcopal palace, three parishes, a collegiate church: it had also three communities of monks, and besides four hospitals. The university, one of the finest before his time, in the town, is well endowed, and contains a numerous and select library.

The cathedral, which is also supposed to be the foundation of the Princes of Fruela in 780, is a magnificent structure of the pure Romanic style, one of the chief churches in the peninsula. It once contained a rich treasury of valuable vases, arms, and other ornaments, but these were almost entirely lost during the French war. The remains of fourteen kings and queens of Asturias are deposited in one of the chapels. There is also another, founded by the Emperor Charles the Great, by King Alphonso the Wise, and by the Princess Eliza, daughter of the Emperor Frederic Barbarossa, and built by King Alphonso the Third, at the instigation of Queen Isabella, in 1290. There are some public walks, ornamented with fountains and trees, the principal being that called El Chambel." The town is provided with good water by a very sumptuous aqueduct of forty one arches, entirely built of freestone.

Oviedo has little or no commerce, like most of the inland towns of Spain, owing to its distance from the sea and to the absence of commodious harbours. The only exports are rum, tobacco, and the few tannery, two manufactories of woollen hats, horn combs, buttons for the use of the peasantry, and some coarse linen stuffs. There is also a manufacture of arms, supported by the government, but the works have of late been suspended.

The population of Oviedo in 1827, the epoch of the last census, was 10,476. It is the birth-place of the celebrated Pejojo, the author of the *Teatro Critico,* Madrid, 1777; of the bishop Don Pelayo, who lived in the time of Fernando el Magno; and of the chronicler and historian of the history of the kings of Asturias; of Luis Fernandez de Oviedo, the author of many excellent works on medicine and botany; and lastly, of the celebrated Marina, the author of the *Teoria de las Cortes.* Oviedo is 47 miles north of Rejo, 19 miles south of Salamanca, 57 miles west of Madrid, and 19 miles east of Vigo.

OVIEDO Y VALDES, GONZALO FERNANDEZ DE, one of the earliest historians of the New World, was born at Madrid in 1476. Being of noble Asturian descent, he was, at the age of twelve, introduced into the royal palace as one of the pages of Prince John of Castile, the son of Ferdinand and Isabella. He continued with the court for a few years, though he afterwards returned to Spain, took part in the campaigns of the Moorish war which preceded the surrender of Granada (1490-92). In 1514, according to his own statement, he embarked for the West Indies, where, although he revisited his native country several times, he continued his work as a historian and chronicler of the Indies. He wrote several important works under the government: he was made governor of the port and harbour of Santo Domingo in the island of Hispaniola or Hayti, and captain of a company of infantry. Charles V. appointed him also to an office of a literary nature, for which he was handsomely rewarded by his vast learning and his long residence in the New World, that of historiographer of the Indies. It was in this capacity that he produced his principal work, *Historia General de las Indias,* in fifty books, twenty of which, making the first part, were printed for the first time at Seville in 1535, fol.,* reprinted at Salamanca in 1547, fol.; and lastly, at Valladolid in 1557. It was translated into French by Jean Pelour, and published at Paris in 1556, and also into English, in a sumptuous collection of the "Historiadores Primitivos de las Indias Occidentales," Madrid, 1749, fol. Oviedo wrote likewise *Tratado de la Natural Historia de las Indias,* Toledo, 1526, besides two tracts regarding the "Palo de Guayan'a,"* in the Guayan's, 1543; and *El Santo y Lignum Vitae,* which are translated into Latin in the first volume of the collection, "Scriptorium de Morbo Galico." But the work for which Oviedo is justly celebrated, though known only to a few scholars, is *El Quienqueyana,* so entitled from its content of fifty dialogues, in which the author is the chief interlocutor. This interesting production contains a very full notice of the principal persons in Spain, their lineage, revenues, and arms, with an

* A copy of this scarce edition, with the author's signature appended to it, was presented to his British Museum."
inexhaustible fund of private anecdote, all which renders it a most valuable addition to the history of that time. This work however still remains in manuscript, in three folio volumes, in the national library of Madrid, and it is only through the extracts of Navarrete that we are enabled to estimate its contents. Oviedo has been accused of treating the Indians employed in the gold-mines with unjustifiable cruelty. His 'History of India' too has been denounced by no less an authority than Las Casas as a wholesale fabrication, almost full of lies and almost as pages; but there can be no doubt that, though somewhat loose and rambling, he possessed extensive stores of information, by which those who have followed him have greatly profited.

The time of Oviedo's death is uncertain, but he must have lived to an advanced age; he is said to have been alive in December, 1558, since the original manuscript above alluded to, preserved in the library at Madrid, is signed by him at the age of 79.

(Navarrete, Coleccion de Viajes y Descubrimientos, Madrid, 1729; Prescott, History of the Reign of Ferdinand and Isabella, vol. 1; Muñoz, Historia del Nuevo Mundo, Madrid, 1793; Pinelo, Epitome de la Biblioteca Oriental, Madrid, 1737.)

OPOVIVPAROUS. An animal is said to be ovoviviparous when the ovum, or egg, is excluded from the body entire and hatched after such exclusion. Birds and the great majority of reptiles are ovoviviparous animals.

OVIS. [SHEEP] OPOVIVPAROUS. An animal is said to be ovoviviparous when the egg is hatched within the body and the young one is excluded alive. Thus, among the Reptiles, the young of the Lizard known by the name of Zootoca vivipara, the Viper, the Rattlesnake, and the Blindworm, are hatched before they are excluded from the body, and many long before such exclusion; indeed it is probable that the rupture of the egg takes place during the parturition. The Monotremes (Echidna and Ornithorhynchus) and the Marsupialia are examples of ovoviviparous mammiferous quadrupeds.

OVULE, in Botany, is the unimregnated seed. It originates from a succulent cellular space called the placenta [PLACENTA], in the inside of the seed-vessel, and may be described as a cellular cone or nucleus, enclosed within one or two coats, which are perforated at the apex of the cone. The latter contains a minute sac, called the sac of the amnion, in which the embryo appears after the process of impregnation has taken place. The examination of monstros forms renders it probable that the ovule, morphologically considered, is a bud; but this doctrine is not universally admitted, and requires confirmation. The modifications of the ovule consist chiefly in an inversion of its parts, and in a loss of one of its membranous coatings, the details of which are suited only to special introductions to botany. An account of them will be found in Lindley's Introduction to Botany, 3rd edition. p. 211.

OVULITES. [OPERCULIFERA.]


OWEN, JOHN. [ZOOLOGY.]

OWEN, W. [BIBLE SOCIETY]

OWTHHEE. [SANDWICH ISLANDS.]

OWLS. [STRIGIDAE.]

OX. The genus Bos of Linneaus consists of those ruminants only which are familiarly known as Oxen; and though at the conclusion of this article we shall endeavour to give a sketch of the family Bosidae, according to the views of modern zoologists, it will treat mainly of Oxen only, or the forms comprised under the Linnean genus above named, and the genus Ovibos of De Blainville.

ORGANIZATION.

Skelet ce: S kull. — The front, or forehead, is wide and flattened; the lacrymal bone is enlarged below and leaves no open space between it and the nasal bone. The upper ocipital and parietal bones unite at so early a period into a single bone, that the calf almost at its birth has them already in the confluent state; but in the earlier stages of the fetus, the two parietal and the two interparietal bones are distinguishable. The occipital suture remains strong below the occipital crest, and so differs from the other ruminants; and the frontal suture reaches up to this crest, thus forming the principal character of the physognomy of the ox. The hole analogous to the spheno-palatine aperture is enormous and is hidden in the sunken space behind the orbital or supermolar prominence of the maxillary bone; at its superior border a small portion only of the vomer is perceptible. The tympanic cavities terminate in long sharp points, and between them the basiary bone presents two strong prominences. The temporal area of the anterior sphenoid bone, which in the antelopes and stags has the crest but slightly projecting, has in the Oxen a strong and sharp projection.

Dental Formula:—Incisors 0 7 8 9 canines 0; molars 6 6 6 6 = 32.

TOOTH OF OX.

(See the figures of skulls of Oxen in the article BISON and those of the Bos Caffer and Bos primigenius below.)

The rest of the skeleton is much like that of the other ruminants, and the following cuts will give a better idea than words of the construction of the extremitiies.

The anterior angle of the spine of the scapula is prolonged, as in the camel, into an acromial apophysis, and the spinal border is rounded; moreover in the Ox the bone of the spine towards the neck of the bone is blended with the anterior border. In the pelvis of the ruminants generally the spinal angle of the osa ili is wider and placed more backwards than the external angle, the truncation of which is oblique and nearly continuous to the anterior border of the bone. The pelvis of the Ox may thus be easily distinguished from that of the horse, which has its spinal angle pointed and as forward as the external angle, which last is more truncated, so as to be nearly square. The ischium of the Ox, moreover, is much more elevated above the cotyloid cavity, the ischiatic tuberosity is truncated so as to present three angles, and the posterior edge of the pelvis

* In the article BISON, vol. iv., p. 462, left hand column, and last line of the third paragraph of the note, for 'son' read 'sum.'
which the skeleton of the ox differs from other ruminants are principally those of size and proportional length and thickness. The annexed cut will convey a general idea of the entire construction, and the several bones are within the reach of most of those who would wish to examine the parts in detail.

Organ of Digestion.—The number and disposition of the teeth will be found at p. 74; and the digestive canal may be well studied by examining the following preparations in the Museum of the Royal College of Surgeons (Physiological Series). No. 555 exhibits the stomach and small intestines of a fasted calf (Bos Taurus, Linn.). The rumen is laid open, showing its communication with the oesophagus and the reticulum, and the several compartments into which it is divided: the two larger occupy the upper part of the paunch; the two smaller form sacculi visible externally at the lower part of the paunch; the latter appear to be analogous to the cardiac sacculi of the Pecary and Kangaroo, both lined with cuticle. The reticulum, or honey-comb bag, is laid open, so as to exhibit the large aperture of communication with the preceding cavity, and the groove, or canal, leading from the oesophagus to the palearium or pleated cavity. It is along this canal that the re-masticated food is conveyed to the palearium, the muscular walls of the groove shutting out the reticulum equally with the rumen. A black bristle is passed through this communication, and the palearium laid open, showing the lamina within it, and the opening into the abomaus, which is left entire. No. 556 consists of portions of the four cavities of the stomach of a calf, exhibiting their manner of communication with each other and with the oesophagus, more especially the canal which leads from the oesophagus to the palearium, and the muscular sphincter surrounding it. This sphincter is endowed with a peculiar irritability, which occasions it to contract upon the deglutition which follows rumination, and to dilate when food is swallowed after having undergone the first mastication only. It is obvious that by the contraction of this sphinc-

Skeleiton of a cow.

...ter the re-masticated food is in great measure prevented from entering either the rumen or reticulum, but must pass directly into the third cavity, the orifice of which is by the same act drawn up towards the oesophagus to receive it. The villi of the rumen are very short and pointed. The stroma of the reticulum and the lamina of the palearium are also beset with villi. The vascular lining of the abomaus is seen to be thrown into broad rugae, in the small portion of the cavity which is preserved in the preparation. No. 559 is the portion of the rumen of an Ox. The villi are still more flattened in shape than they are in the sheep, and are pointed at the extremity (whereas those in the sheep are dilated), except near the reticulum, where they assume the form of lamina with irregular jagged margins. No. 560 presents a small portion of the American Bison, in which the villi are much longer, coarser, and of a darker colour. In No. 584, A, a portion of the reticulum of an Ox is shown, where the cells are seen chiefly disposed between broad parallel septa, and the larger cells, formed by the narrower transverse septa, are again divided into smaller cells. No. 564, B, is a small portion of the palearium of an Ox, prepared to show the different sizes of the lamina of this cavity. These lamina are of two kinds, large and small; the larger ones are of two sizes, which alternate with each other; but between each of the larger lamina a small one is interposed. They are all beset with papillae, and lined with cuticle, part of which has been turned down from one of the largest lamina. No. 586, A, is a small portion of the spleen of a calf (Bos Taurus), which has been macerated after distention of the cells, to show the meshes of the cavernous structure of the spleen and the large size of the cells or spaces which they intercept. (Col., vol. 1.) It should not be forgotten that the tongue of the Ox performs a principal part in collecting the food before it is submitted to the organs of mastication and digestion.

Urinary System.—In the same museum will be found (No. 1232) the kidney of an Ox (Bos Taurus) magnificently injected, and a section removed to show the ramifications of...
the pelvis, or elongated infundibulum. The cortical substance presents externally a number of folds extending inward a varying degree corresponding to the separate cones of tubuli uriniferi within; this gives a lobated structure to the gland, which is permanent. A similar structure is observable in the human kidney at an early period of existence, but it is afterwards obliterated. The Long-eared Water Hemlock would seem to be a case in point, for showing three mamillae converging to terminate apparently in one infundibulum; and No. 1258 exhibits a longitudinal section of the kidney of a bos, showing the numerous medullary cones and the ramifications of the pelvis which extend into the substance of the kidney to surround the mamillae and receive the urinary secretion. The cortical substance is thinner than in the Ox, and the kidney shorter and broader. (Cat., vol. ii.)

Braun, Nervous System, and Senses.—No. 1236, in the Physiological Series of the same museum, shows the brain of an Ox (Bos Taurus) injected, and the pin matter removed from the left hemisphere to show the convolutions, which are more numerous and wavy than in the sheep. In the Ox, the brain is acute in shape and soft to the touch. The anterior perforation of the choordal coat, or papil, is oblong. In the Physiological Series of the museum of the College, the broad transverse tapetum lucidum of the eye of an ox is well shown in the preparation No. 1728. The pigmentation of the cornea, as well as that of all the other parts of this organ, that are feeding on grass, has (in the same eye) certain portions which are white, and other which are of a fine green. The eyelids and conjunctive membrane of a cow are exhibited in No. 1768, and bristles are placed in the puncta lachrymalis, and the ears and horns of the bovine glands. Hearing, also acute.

Smell and Taste.—Well developed. No. 1256 of the series above alluded to shows one of the inferior turbinate bones, with the pituitary membrane injected. The taste is acute and that is why no plants are fatal to the Ox. Must, in conjunction with the smell, enable the animal to distinguish and select the food which is most nutritious. The plant is a greenish feed in summer and brownish feed during the winter. It is the feeding on the grass that makes the animal so long endure the winter, and the cattle that are left off their winter fodder and returned to grazing; the disease diminished as the summer came on, at which time, as well as in the autumn, few died. The distemper was propagated irregularly and not by contagion: the cows that were driven in the spring to the poppy meadow where they were landed, and where he saw plenty of the Long-eared Water Hemlock, and there they died swollen and in convulsions. In other places the plant was scarce. The least attention to it usually results in loss, and cattle above all other animals are ever to the damage, and distinguish poisonous plants from salutary by natural instinct; so that this plant is not eaten by them in the summer and autumn, which is the reason that in those seasons so few cattle die, viz. only such as have been exposed to it. But when they are let into the pastures in spring, partly from their greediness after fresh herbs, and partly from the eminness and hunger which they have undergone during a long winter, they devour every green thing which comes near them; the same feed in winter, and their litter is such, that are small, and scarcely supply food in sufficient quantity. They are beside more juicy, are covered with water, and smell less strong, so that what is noxious is not easily discerned from what is wholesome. I observed likewise that the most esteem the feeding on poppy meadow, more especially in the province of Limburg, and it confirms what I have just said. I saw this plant in an adjoining meadow moved along with grass for winter fodder; and therefore it is not wonderful that some cattle, though but a few, should die of it in winter. After I left Tornes I saw this plant in all the meadows near Limmeningen, where it appeared along the road; and when I got into the town I heard the same complaints as at Tornes, of the annual loss of cattle with the same circumstances. The cattle, I observed, regard as distemper or fever that a hungry stomach will often drive animals to feed upon plants that were not intended for them by nature. But whenever this has happened, they, if they escape, become more cautious for the future, and acquire a certain kind of instinct which is also very dangerous. In the instance where I was in the province of Schonen and Westgartha commonly fall into a dysentery, when they came into the woodland parts, because they feed upon some plants which the cattle used to those pieces have learned to avoid. Mendaea-Saffron is among the plants deleterious to oxen. I have seen in such large quantities that the Heliotrope is also said to be poisonous to them. Few is fatal, as it is to herbivorous quadrupeds generally, the greenstuff being tempering probably too strong for cattle kept on short pasture. All of this in this country have not been uncommon against a defends a meadow. I was told that a hedge, whereby the plaintiff's cattle strayed into places where yew-trees grew, fed on the branches, and so died.

Preparations illustrative of the organs of generation in the male. No. 1259, a paper, which I exhibit in the Physiological Museum of the College, Nos. 2557, 2538, 2559; and Nos. 2756, 2757, 2758, 2759, and 2760, illustrate the female organs, the first of the last-named numbers exhibiting those of the American Bison, and the others those of the Cow (Bos Taurus).

The period of gestation is nine months. The normal number is one; though there are not uncommon instances of the cow bringing forth twins, and rare cases of her producing three, and even more, at a birth. In the case of twins, if they be male and female apparently, the apparent female is generally barren, and is called a Free Martin (Taurus probably of Columella, Varro, and the ancient Romans).

Mr. Jess (Glimpses of Natural History, 1838) states that if the cow has twi, some of them a male and the other
A female, the latter is always barren; but this is an error, as we shall presently see. 'It is a fact known, and I believe almost universally understood,' writes John Hunter, in his *Account of the Free-Martin,* that when a cow brings forth two calves, and one of them a bull calf, and the other a cow, it is said that the animal is considerably larger than either the bull or cow, with horns similar to those of the ox. Its hump is like that of an ox, having more resemblance to that of the cow than the bull, and, like the ox, it is used for the rack, and to pile the horns in the cellar, wider in the region of the horns. It is considered finer in bone than that of either bull or cow, and to surpass that of the ox and heifer in delicacy of flavor, bearing therefore a higher price in the market; but there are many exceptions where the flesh has been nearly as bad as bull-calf, certainly worse than that of a cow.

That the twin female is not always barren while the other calf is a male is proved by the following among other instances. Hunter relates that a twin belonging to Benjamin Way, Esq., of Denham, near Uxbridge, produced twins which appeared male and female. The latter died when about a month old. Upon examining the organs of generation, Hunter found that they were perfectly formed, and that the female twin was a calf of a common cow-calf, and in comparison found them exactly alike. This, he concludes, 'made us regret that the animal had not lived to an age that might have determined if it was capable of breeding; for the construction of the parts being to appearance, perfect, it might have been supposed that we had a perfect female. It is however most probable that this was a perfect female, which is an exception to the common rule; and I have been informed there are instances of such cases in the provinces of Holland and Belgium. Prof. Holroyd, in his *Observations* (1817), adds a note from Lou don's *Magazine of Natural History,* which states that Joseph Holroyd, Esq., of Withers, near Leeds, had a cow which calved twins, a bull-calf and a cow-calf. As popular opinion was against the cow-calf breeding, it being considered a free-martian, Mr. Holroyd was determined to make an experiment of them, and reared them together. They copulated, and in due time the heifer brought forth a bull-calf, and she regularly had calves for six or seven years afterwards. Nor are there wanting other cases of fertility under similar circumstances.

Hunter gives a dissertation of three free-martins, a portrait of one, and figures of the organs of generation of all three, in the work last above mentioned, to which we refer the reader for further particulars.

When a cow has twins and they are both bull-calves, the calves are in every respect perfect bulls; and if cow-calves, they are both perfect cows. At least we are not aware of any recorded instance to the contrary, nor have we ever heard of one.

In the *Nouveau Bulletin des Sciences* is given an account of a cow which produced nine calves at three successive births: first, four cow-calves, in 1817; second, three, two of them females, in 1818; third, two, one female and one male. With the exception of two belonging to the first birth, all were nursed by the mother.

**European Oxen.**

In addition to what is stated with regard to the supposed origin of our British domestic horned cattle in the article *Bison* (vol. iv., p. 481, et seq.), we proceed to the consideration of the further opinions published on this difficult subject.

Colonel Hamilton Smith, who appears to have taken considerable pains in investigating the history of the *Ruminantia* generally, and of the Bovine family particularly, places the fossil species under *Bos Taurus* *Urus,* considering the wild cattle of Chillingham and other parcs as the white variety.

Mr. Swainson (Classification of Quadrupeds) observes that all writers agree that the large skulls of oxen found in the more recent formations belonged to a formidable race of these animals which existed in Britain in a wild state; that they belonged without doubt to the species named *Urus* by Cesar and other antique writers; and that these skulls not only possess a species character, but are so formed as to show a shape different from that of the domestic ox.

All these skulls, he continues, are nearly one-third larger than those of the *Bos Taurus*; they are square from the orbits to the occipital crest and somewhat hollow at the forehead. The horns, placed at the side of the above crest, show a peculiar rise from their roots upwards; then bending outwards, and then forwards and inwards. No domestic races show this turn; but numerous specimens of fossil oxen have this shape, and the wild bull of Scotland, the only example of this type now known to exist, retains it. The domestic oxen, on the contrary, of whatsoever country or breed they may be, have the square concave forehead, the horns rising from the horns in the same direction, and much in the form, if not in the details, of the fossil ox.

It appears then that the ancient *Urus,* or wild bull, was a perfectly wild, savage, and untameable animal; not only does every account handed down from remote antiquity assure us of it, but it is the only living example of this form we possess, the *Bos Scoticus,* still preserved in one or two of the northern parks. Although domesticated so far as to live within such precincts without absolute unprovoked violence to its keepers, it retains essentially the character of the wild stock.

The wild oxen are described by Mr. Swainson as living in the open moors and pastures, and only coming into the plants in the hope of obtaining some sustenance. Sir W. Jardine (Naturalist's Library, *Ruminantia* part ii., 1836) remarks that by most persons it is thought that the domestic races of our cattle are originally sprung from the *Bos budesius,* the Indian and European buffalo. Sir C. Williams, in *treat of them as arising from the aurochs or wild cattle of Germany and Poland. These, according to the system of Smith, come into subgenera different from the domestic breeds; and from both these suppositions the opinion of Baron Cuvier varies, as he is inclined to consider our present cattle identical with a species no longer existing in a wild state, but which has, by the exactions of man, as in the instance of the camel and dromedary, been for ages entirely subjected to human control. The existence of this animal in the formation of a fossil state, and it is upon the comparison of these remains with the skeleton of the aurochs, the buffalo, and our domestic races, that the Baron has founded his opinion.*

Sir R. Bell (British Quadrupeds, 1839—1843,) after referring to Griffith's Cuvier for Colonel Hamilton Smith's interesting and learned dissertation upon the mythology and antient history of the ox, says, *Whether the ox exist now, or have existed with the range of sound historical testimony, in its original state, or whether, as in the case of the horse, all the instances of the occurrence of wild oxen of this species now on record have not been derived from the*
Domestic race, fortunately escaped from servitude and become wild, is a question which it is difficult if not impossible satisfactorily to solve. The ancient accounts of the Ursus, or wild bear, told it to have been an animal of enormous size and great fierceness; and the horns are described as being large, spreading, and acute. In this country, and in many parts of the Continent, have occurred numerous fossil bones of oxen, with large horns, having the form and dimensions of those of certain breeds in our present time, particularly of such as are most wild; as for instance the celebrated white oxen of Craven, of Chillingham Park, and of Scotland, the Bos scoticus of some authors. I cannot but consider it as extremely probable that these remains may belong to a species of horned oxen, distinct from the common domestic ox; and some modifications of structure have been cited in proof of this opinion. It does not appear to me however that these modifications are of sufficient value to constitute specific distinction, as they appear not to agree with the varieties which are variable in pedigree breeds of the domestic cattle; they are, some slight differences in the form and direction of the horns, and the existence, in old Bulls, of a short rudimentary mane, and some hair upon the breast. Nor is it certain, for two or more closely related species to form a specific distinction, even were the form of the horns less variable than they are in our domestic oxen. We require yet a series of well authenticated and well directed experiments on the intermixture of the distinct species in order to investigate the domestic bears, and the fertile or infertile character of the progeny; which, if the views I have so repeatedly stated be correct, would at once decide the question. Even Colonel Smith himself, a high authority in these matters, although he urges the species distinction of the two animals, says, "the character of the domestic oxen is absolutely the same as the fossil, and the wild breeds differ only in the flexure of the horns and external appearance, occasioned by the variations of climate, food, and treatment." But, it may be asked, do variations of climate, food, and treatment produce such great differences in the horned oxen? And yet this distinction is, as I have just stated, held both by Col. Smith and Mr. Swainson. Upon the whole, I cannot but believe that the fossil bones belonged to the original stock of our domestic ox, and that the wild white cattle, the Bos scoticus and Ursus scoticus of the ancient naturalists, have not yet found a natural approach so near to it as to leave it a matter of doubt, not whether they all belong to the same species, but whether this breed be the actual remnant of that original stock, or the descendants of domestic individuals, which have remained in a great degree their wild character, retained through many generations to feel the effects of human domination.

Mr. Henry Woods, in his Description of the fossil Skull of Bos primigenius, of Melkham, Wilts, 4to, 1839, after premising with reference to this part of the inquiry, that unfortunately two distinct species of Bos have received the title of Ursus, states that the subject appears to him to stand thus: "The Ursus of the ancient writers, Linnaeus, is the Ursus, or bear, of the British and Northern Europe, in some parts of which it is said to exist at the present day, particularly in Lithuania, Poland, &c., which is however somewhat more than doubtful; this being the real Ursus (most probably a very old species), and Ursus of Linnaeus, in whose time a remnant of the race seems to have existed—the aurochs of ancient Germany, and the typical species to which the remains here described are to be referred."

The aurochs, or wild ox, or oxen of the ancients, Bos bomby between the latter and the varying character of the different races of the Bovine genus, and giving a detailed account of the habits and structure, and more particularly of the bony skeleton, of the celebrated breed, which is at present restricted to Lithuania, Moldavia, and the Ukraine, and to a few remoter parts of the Russian dominions, that the conclusion that the Ursus and Biston of the Greeks and Romans, and of later European authors, are one and the same animal; and he refers the fossil remains of the genus to two distinct types; the one which he designates Ursus, the distance of twenty five yards, looking wildly at the object of their surprise; but upon the least motion being made, they all again turn round and fly off with equal speed, but not to the same distance: forming a shorter circle, and again returning with a bolder and more threatening aspect toward the place of discovery; and on my ranging them in a circle of thirty yards, when they make another stand, and again fly off: this they do several times, shortening their distance, and advancing nearer, till they come within ten yards, when most people think it prudent to leave them, not because they have had any accident that happened to the writer or his narrative, but because in two or three turns more, they would make an attack. The mode of killing them was perhaps the only modern remains of the grandeur of ancient hunting. On notice being given that a wild bull would be killed on a certain day, the inhabitants of the hamlet would come armed with guns, &c., sometimes to the amount of a hundred horse, and four or five hundred foot, who stood upon walls, or got into trees, while the horsesmen rode off the bull from the rest of the herd, and when a markman discovered the animal to be alone and shot. At some of these times, ten, fifteen, twenty or thirty shots have been fired before he was subdued. On such occasions the bleeding victim grows desperately furious from the smarting of his wounds and the shouts of savage people that surround him. He fights with all his strength; and if an accident that happened, this dangerous mode has been little practised of late years; the park-keeper alone generally shooting him with a rifle gun at one shot. When the cows calve, they hide their calves for a week or ten days in some sequestered situation, and go to and from them two or three times a day. If any person come near the calves, they clap their heads close to the ground, and lie like a hare in form to hide themselves; this is a proof of their native wildness, and is corroborated by the following circumstance. The writer, when he found a hidden calf, two days old, very lean and very weak—on stroking its head, it got up, pawed two or three times
An old bull, bellowed very loud, stepped back a few steps, and bolted at his legs with all its force; it then began to paw again, bellowed, stepped back, and bolted as before; but knowing its intention, not desiring any ill, or of the flea, it moved off, and was so very weak that it could not rise, though it had made several efforts; but it had done enough; the whole herd were alarmed, and coming to its rescue obliged him to retire; for the dams will allow no person to touch their calves, and are extremely account of this animal. It was described by Robert Brown, Esq., chamberlain to the duke. These cattle are larger and more robust than Lord Tankerville's: their body is dun-white; the inside of the ears, the muzzle, and the hoofs black; and the forepart of the leg, from the knee downwards, is dun-white. The cows seldom have horns. Their heads are rounder than in the Tankerville breed. The roof of the mouth is black, or spotted with black, and the tongue is black, and generally tipped with black.

Mr. Hindmarsh's paper read to the British Association in 1838, gives a history of the principal herd at Chillingham, and a graphic description by Lord Tankerville himself. Sir Philip Egerton ("Annals of Nat. Hist.,") 1833) states, on the authority of a MS. record, that the same breed of wild cattle existed at Bishop's Auckland in 1635. Mr. Woods thinks that there appears evidence that their being truly descendants of a native race, and quotes Lord Tankerville's letter. 'In the first place,' says his lordship, 'I must premise that our information as to their origin is very scanty; and even when we vaguely infer it rests on conjecture, supported however by certain facts and conceptions, which lead us to believe in their ancient origin, not so much from any direct evidence, as from the improbability of any hypothesis ascribing to them a more recent date.'

It is dangerous to prophesy; but we venture to believe, if a cross with the common bull were to be permitted, the offspring would be as fertile as any of the varieties which now adorn the pastures of Great Britain and Ireland.

The most accurate representation of the Chillingham breed known to us, with the exception of Edwin Landseer's, is 'The Wild Bull of the Ancient Caledonian Breed, now in the Park at Chillingham Castle, Northumberland,' designed and engraved by Thomas Picken, and printed at Newcasle by Solomon Hodgson, in 1789. The size of the cut was 9 inches by 14 inches, and only 230 copies were printed. It was the largest wood-cut that Thomas Bewick ever engraved, and is justly celebrated as his masterpiece. After the few impressions were taken, the block broke into several pieces; these pieces were bound together with iron, with the exception of the figured border, which was about three-quarters of an inch in breadth, cut upon several pieces of wood, and put round the block; these impressions were printed by Edward Walker, Newcastle, without the border; the size of the cut being then reduced to 7 1/2 inches by 5 1/2 inches. About six proof impressions were taken off on vellum from the block in its original state, and are highly valued. (Memor. Select Folles, 1832.) The figure of the Wild Bull in Bewick's "Quadrupeds" is tame in compara-ition.

We now proceed to consider the Ox in an economical point of view.

Ox or Steer is the castrated male of the bovine race: he is called an ox-calf or bull-calf until he is a twelvemonth old, a steer until he is four years old, and after that an ox or bull is selected for the future propagation of the breed, the others are castrated between the first and third months.

The advantages derived from the performance of this operation are very great. The nutriment, which is no longer directed to the sexual organs, goes to the development of the frame; the propensity to fatten is abundantly increased, and the animal becomes far more docile and tractable. The use of the ox in agricultural and other labours may be traced in almost every country and to periods of the remotest antiquity.

The education of the steer should commence between the second and third year. At an earlier period he has scarcely sufficient strength, and at a later one he may become obstinate and self-willed. His education should be founded

* The White Bees is certainly an example to the contrary; but it may be observed as an exception to an almost general rule; the states of the Alpine bees are merely instances of inter-dress.
on patience and kindness, and then the term of it will be far shorter than is generally imagined, and the result will be permanent.

There has been much dispute with regard to the comparative advantage of the employment of cattle and horses in agricultural labours. The former are said to cost less and to be supported at less expense. For the latter it is pleaded that a smaller number is needed to perform the work, on paper at least, far more quickly performed, and that it is always abundantly greater. The plain matter of fact however is, that although the ox is still used for slow and heavy work on many farms, he is not so generally employed as he used to be, and his subjects are warmest advocates, and the use of him has been completely abandoned by a very considerable number of agriculturists.

In the native counties of the best breeds, he is still admired and valued as a beast of draught, but by the majority of farmers his value is now chiefly or solely estimated by the quantity and quality of the meat that he will yield, according to the care that is bestowed upon him and the expense that is incurred. He is in the fullest perfection at four years old, and he will then prove more profitable to the farmer than if he were worked four or five years longer, when the quality of his flesh will be deteriorated and his disposition to fatten considerably impaired.

The consideration of the principal diseases of cattle was purposely deferred till their different breeds and varieties are described, which is reserved for the next article. There are too numerous as those of the horse, but there is often considerable difficulty attending the treatment of them. From the peculiar temperament of the cattle and the comparatively great quantity of water which flows in their intestines, the recognition and the treatment of disease is of far greater consequence than in the horse, rapid as is often the progress of his maladies. Few of the diseases of the horse destroy him at once; but there are many maladies of the ox which may produce the same instant, or they will be uselessy strugled with afterwards. Let the owner and the veterinary surgeon take good heed of this.

The diseases of calves should be first considered. They are as numerous as those of the colt, and more fatal. At this period of their life they should never be neglected many days; when the calf is suffered to continue by the side of its own dam. Both starvation and excess of food in the mother will produce it. More particularly will this be the case when a foster-mother is employed. If she has calved but a very few weeks before the newly-dropped young one is put to her, the bowels of the calf will almost certainly be disturbed. Where it can conveniently be accomplished, every calf should be reared by its own dam. A state of constipation should never be neglected many days, and more especially if the animal loses its gait or is in evident pain, or the dung is unusually offensive or tinged with blood. The grand cause of this acidity is in the stomach or intestines, which gradually causes inflammation of the intestines, which is then a source of continual communication to the general constitution, and exhaustion and death ensue. Then recourse must be had to a compound medicine, the value of which cannot be too highly estimated. It is borrowed from the work on 'Catties,' published by the Society for the Diffusion of Useful Knowledge, and the farmer should never be without it. There should be an alkali, chalk, to neutralise the acid; an astringent, catechu, to arrest the discharge; a sedative, opium, to allay the irritation; a diuretic, ginger, to promote the strength of the stomach, or the patient. These should be mingled in the proportions of eight parts of the first, four of the second, one of the third, and two of the fourth. A large teaspoonful of this powder should be given twice or thrice in the day, according to circumstances.

Costiveness is a contrary disease to this. It should never be suffered to continue long, for it is fraught with danger. The best apert for calves and cattle is Epson salts, in doses of from one to two ounces, with a scruple or half a dram of ginger.

A cough should be promptly attended to the moment that it is heard. A dose of physic, small doses of powdered foxglove, with nitre, or, in bad cases, a slight bleeding, will usually cure.

In proceeding to the diseases of adult cattle, we are struck with the numerous diseases of the eye. Ulceration of the lids will generally yield to the nitrated ointment of mercury locally applied, and a course of alterative medicine, Warts should be excised by means of a pair of scissors, and the root touched with nitric of silver.

Inflammation of the anus, a thick gaudant ointment, or the tincture of opium, lowered with ten times its quantity of water, will be useful; but if there is any fungous growth on the haw, extirpation will afford the only cure. Inflammation of the eyelids will generally yield to applications of warm water. For the inflammation of the eye, warm or cold fomentations, the former at the first, and the latter a day or two afterwards with the opiate lotion at the commencement, and a very diluted one of white vitriol—two grains to the ounce—when the eye is set. If the former be employed, an ale of dose of physic will constitute the most successful means of cure. Ulceration of the eye will be best treated with the opiate lotion, but cataract and gutta serena do not admit of cure.

Infection of the horn, if the bones are not quite separated, they may be bound together by tared cords or splints. If there is a perfect fracture of the bone, it should be shewn off as closely as possible to the head, and a hot iron passed over the surface.

Water in the head in calves, known by the enlargement of the head and the stupidity of the animal, admits not of any cure. The giddiness which is sometimes observed in them and even in the adult beasts—turning round and round and round—

Appenley, or sudden determination of the blood to the head, produced by the forcing system being carried too far, and the process of fattening hurried too rapidly on, can be cured only by the most decisive measures. The animal that has been thus excited, if it is promptly bled, and its purgatives administered and continued. Phrenzy is produced by the same cause, and can only be cured by the same treatment. In these cases, 15 or 20 drops of the croton oil should be added to the aperient. Locked jaw too is a fatal and dangerous condition. The only hope of cure consists in active bleeding and the continued use of Epson salts and croton oil, until the bowels are opened. Immediately after the bleeding, the jaws will usually be found sufficiently relaxed to admit of the administration of medi-

This golden opportunity of course, the administration of a diuretic, an aperient, and a Tonic, as a diuretic, a Tonic, as a

A little mild physic, with warm comfortable drinks and gently stimulating applications, will hasten and confirm the cure. Connected with or a consequence of rheumatism is swollen joints, yielding sometimes to stimulating embrocations and comfortable lodging. There are however other tumours unconnected with the influence of cold; such as fluctuating tumours, usually about the knees, which require stimulating embrocations and the occasional use of the heat. Small doses of the white antimonial powder, the use of stimulating embrocations, with warm lodging and good food, especia-

mashes, will be useful adjuvants.

As for that species of nervous affection, rabies or madness it is generally fatal. But it is but one case, namely the bite of a rabid or mad dog. If a farmer knows that certain beasts have been bitten, or has strong reason to suspect that he will act wisely in sending them to the butcher, It
after the disease has once appeared, there is no cure, and
the meat is spoiled.

It is time to recur to the diseases of other systems and
parts. Too frequent and destructive is that inflammation
of the tongue and mouth, recognised by the name of blain.
It consists of vesicles and tumours occupying the side of the
tongue and the membrane of the mouth, speedily ulcerating,
becoming gangrenous, producing much swelling of the face
and neck, and frequently fatal in a few days. The swelling
under the form of an epidemic, and it is frequently
together.

The mouth should be well cleansed with a so-
tution of the chloride of lime. Blood should be abstracted
in an early period of the disease, and mild purgatives ad-
mixed; or, if the pulse is the only evidence of the
infection being present, before any treatment is adopted, the
chloride of lime should

still be used, and also the physic, but it should be accom-
panied by some stimulating ingredients, as gentian or
ginger, or both.

Acute cases are subject to fever. The dry muzzle and the
best at the root of the horn, and the heaving at the flanks,
are sufficient proofs of it. If this is early observed, a dose
of physic and or two or three washes will usually set all right.
At times however the attack is sudden and more violent,
and death supervenes before the very commencement. The
farmer recognises this affection by the terms black-quarter,
quarter-ill, blood-striking, &c. The beast is seen with its
head protruded, its nostrils expanded, and its flank heavily
raised; the pulse is rapid, and the breath is noisy and
rhythmical. There is a peculiar crackling sound if the loins are pressed
upon, and the slightest pressure gives extreme pain. Ulcers
appear on various parts of the body, and every part seems
tending to corruption. This disease is sometimes epidemic,
but very frequently the owner is aware of the preceding
process being hurried on too rapidly. In the early stage of
such a complaint, the treatment will consist of copious bleed-
ing and brisk purging. These should be continued until they
produce their effect, and then some sedative medicine, as
fuxgalls, compound tarry, or the like, be used. Then the
ulcers are dressed with a mixture of pungent resin, and the
ulceration is stopped before it is perfectly completed. For
about the beast may con-
tinue to thrive; she, for it is oftenest a disease of the female,
may increase in condition; but she will presently begin to
become corpulent, and the udder may be diminished by this
disease. The animal must be disposed of or destroyed.

First among the diseases of the digestive system is choke-
ing, or the stopping of a piece of carrot or turnip, or other
hard substance, in its passage down the gullet. The cat-
trice or the card-phill is resorted to, in the case of foals
along the canal, and much mischief has ensued from the
violence that has been resorted to on these occasions.

Probes are now constructed at trifling expense, and may be had
from most surgical-instrument makers in town and country,
by means of which the purpose may be readily effected, and
without danger.

From the gullet the food passes into the stomachs of the
animal, of which there are four. The first is the rumen,
or paunch, into which the imperfectly masticated food, as
indicated above, is conveyed. The second, or reticulum,
is not essentially necessary, and is prepared to be returned for a second or more complete
grinding. Sometimes this stomach becomes overloaded
with food: this is the grain-side of the dairy. The animal
refuses to eat, he becomes uneasy, moans, swells at the
flanks, and a kind of unpleasing scent pervades him. The symptoms are often treacherous, and would
deceive him who was not thoroughly acquainted with the
diseases of cattle; but the introduction of the probang, if
necessary, will reveal the real state of the case. The sto-
mach is examined, and the probang and finger are inserted;
the fluid can be injected into the stomach, and the hardened
mass may be rendered more fluid, and removed by means of the
pump; or, if the stomach is too full to admit the
probang, and to be thus evacuated, an incision may be
made in the flank, and the accumulated mass withdrawn
by the hands.

At other times an unnatural fermentation commences,
and the stomach is inflated with gas. One look at the
flanks will sufficiently indicate the inflation of the paunch.
This is termed Hemorrhagic. The first indication of cure is to get
rid of the gas. This may be accomplished by the intro-
duction of substances that will chemically combine with
it. The chloride of lime will effect this. The principal
ether of the liquor is chloroform. It leaves the side
bound with the hydrogen, and the compound does not occupy a thousandth part of the

space previously occupied by the hydrogen. Two dramms of the chloride of lime will form a cheap and very efficient agent.

At this time, then, a card will be put in the paunch,
with the disengagement of the gas, the aperture through the
skin and that into the rumen will cease to be accurately opposed to each other; and some of the gas and the
contents of the stomach will enter the cavity of the abdomen,
and will be the cause of future illness, or, perchance, of
death.
The gas having escaped, a purgative should be administered, with a double dose of the aperient, in order to excite the stomach to resume its duty. The loss of tide, the cessation of rumination, is only the indication or the consequence of other disease, and will cease with it. If the nature of that disease is not clear, a dose of physic, with the usual or more than the usual quantity of the carminative, may be given.

The third stomach, the reticulum, or honey-comb, is few, and not easily distinguished. The simple function of that stomach is to prepare the pellet of food for remastication.

The third stomach, the manubius, has more to do. The food which has not undergone sufficient comminution in the second mastication is seized by the rough and powerful leaves of this stomach, and is ground down, as it were, in a living mill. Sometimes however there is a deficiency of moisture in this stomach, or the muscular appa- ratus, the reticulum the manubius, cannot act; at length the manubius becomes perfectly paralysed by the distention caused in consequence of the undue quantity of food which is accumulated in it. This is known by the name of reticul-bound. The symptoms are not always evident. Inflammation of the stomach, distension, and flatulence, are among the usual indications. The treatment is simple, but too often ineffectual. It consists in the frequent administration of small doses of purgative medicine, with more than the usual quantity of carminatives; at the same time a great quantity of water is given, with or without the trochee of a horn or the stomach-pump, made to flow down the gullet and pass through the canal at the base of this stomach, thus gradually disagglutinating and washing away a portion of the accumulated and hardened contents. In the dog or cat, or fourth stomach, is inflammation, designated by evident uneasiness, the resting of the muzzle on the situation of this stomach, or a peculiar stretching out of the fore-legs. Venesection and purgation are the only means used in this case. As the inflammation of disease in the spleen little is known. Inflammation is often found in it, with enlargement, induration, or softening, of its substance. These circumstances however are rarely suspected during life. The signs of these organs appear to be peculiarly prone. A yellowness of the skin betrays the existence of biliary affections in a great proportion of the inhabitants of every dairy. When acute inflammation of the liver exists to any considerable extent, not only this yellowness, but the other signs enumerated will be found, but ten times more pronounced on the right side, fullness there, and the direction of the muzzle to it. The proper remedies are those used in inflammation of other visceras, with the addition of blisters over the diseased part. Chronic inflammation is far more prevalent than the acute; the first is remedied by a general diet, the second by a diet of broths, with the addition of stimulating medicines, and fright in frequence of the process.

The remedies are gentle purgatives and succulent food. When obstruction of the biliary ducts takes place, there is still a deeper yellow, invariably accompanied by loss of condition. The animal then is tender, not suffering from mucus, accompanies it, recourse must be had to bleeding and to physic.

Among the various intestinal diseases of the ox stands enteritis, or inflammation involving all the coats of the intestines. Young and fat animals are most subject to it. It is not however of very frequent occurrence, except in epidemics, and then it is very destructive. Wood evil and more ill are varieties of the same disease. They must be treated by bleeding, purgatives, blisters on the belly, mash, and gruel.

Diarrhea, or purging without the discharge of mucus mingling with the feces, is produced by various causes, and particularly by a change or excess of food. It is often epidemic in the autumn. A mild purgation should first be given, and then the stomach should be inflamed by a clysme, orange, medicine, already recommended for a similar disease in calves.

Dysentery in the adult, as well as in the young animal, is indeed a fearful disease. Its causes are often obscure, and the means of successfully arresting its progress are a desideratum. Its principal characteristic is the discharge of mucus with the feces, recognised by the appearance of bubbles standing for awhile on the feces. The length of time which they continue unbroken may be considered as the measurement of the quantity of mucus actually discharged, or, in other words, of the danger of the case. The progress of the disease is rapid or slow according to circumstances which it is difficult to appreciate; but, in the usual course of things, the animal wastes away almost to a skeleton, and then dies.

Notwithstanding the purging, the first indication of cure is to bleed. It is an inflammatory disease, and that inflammation must be subdued. The ablation of blood should succeed the administration of a purgament, and aperient, oil, being the least irritative, will be the first. The injections of gruel should follow; and, when the animal has resumed its natural character, astringents may be administered, at the very head of which, in this case, stands opium: a little calomel should perhaps be mingled with it as an astringent, and after it, with a tonic, to increase the cure. Cattle are subject to flatulent and spasmodic colic, for both of which the vegetable tonics will be the best cure, with a little of the chloride of lime to absorb the gas, and the abstraction of blood if there is any inflammatory action. When the animal is striated, the belly fills again, nor will any physic or diuretic be of any use.

Among the supposed diseases of the urinary organs, but much oftener of the digestive ones, stands red-water, so called from the colour of the fluid which is evacuated. It is materially connected with the pasture, but sometimes it occurs in an entirely artificial way. In the acute form of the disease in the calf, provided the Epsom salts, alone or with a small portion of aromatic powder, are administered. Dropsey in cattle seldom admits of cure. Although an operation may be resorted to, the belly fills again, nor will any physic or diuretic be of any use.

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Garget is inflammation or ulceration of theudder. The milking congests, and fraction of the belly should not be omitted. For strangulation of the intestines there is no idea any cure but by means of an operation which a skilful veterinary surgeon alone can perform. In cases of constipation, the aperients must sometimes be long administered, and after them purgatives. In the acute form of the disease, provided the Epsom salts, alone or with a small portion of aromatic powder, are administered. Dropsey in cattle seldom admits of cure. Although an operation may be resorted to, the belly fills again, nor will any physic or diuretic be of any use.

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which is reduced from that by a native artist, prefixed to Mr. Colebrooke's paper (Astratic Researches, vol. viii.), to which we refer the reader for further interesting particulars.

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**Ox**

Mr. Bird proved that the Gayal will breed with the common Indian bull: he brought a domesticated female Gayal from Chittagong to Dacca, directed a common bull (of the breed Dawai, a Zebu of the common kind found in the middle districts of Bengal), which the female received upon saying blinded with a cloth thrown over her eyes. The offspring was a cow resembling mostly the Gayal mother; and from that cow, impregnated by a bull of the same common breed, another cow was produced, which also had grown up, and was in calf by a common bull when Mr. Bird was in the possession of it (Astratic Researches, vol. viii.).

General Hardwicke gives a figure of the head of the true wild, or as the natives term it, the Assal Gayal (a female), from the south-east frontier of Bengal. The space between the points of the horns was fourteen inches.

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**Ox**

Astratic Oxen.

Mr. Bennett (Gardens and Menagerie of the Zoological Society), treating of the Indian Ox (Bos Taurus, var. Indian), says, "In addition to the domesticated species known by the names of Oxen, Buffaloes, and Yaks, the genus Bos comprehends several others equally distinct, which have rarely if ever been reclaimed from their native wildness. Two of these, the Bison and the Musk Ox, are peculiar to the northern regions of America; one, the Polish Aurochs, is now confined to a single European forest; a third, the Ardæ, exists only in Central Asia; and a fifth, the Cape Buffalo, is, as its name imports, a native of the southern extremity of Africa. Thus it appears that in this wide dispersion of the several races, each region has preserved its own peculiar kind in its original independence; while, on the other hand, two at least of the remaining species, the Ox and Buffalo, which are no longer to be found in a state of nature, have been industriously propagated under the auspices of mankind, through every part of almost all the domesticated, remains confined within its primitive limits, in Thibet namely, and a part of Tartary, where it is said to be generally cultivated, almost to the exclusion of every other race."

We proceed to notice a certain wild Asiatic oxen.

**Bos Grysus**, Gavaya, Sansc. = Gloci or Gayal, Hind.; Gobgyora, Beng.; Gavjungal, Pers.; Méthand, Mountaineers (Côcôa, &c.) east of Silhet; Shid, Mountaineers (Côcôa) east of ChitQuag; Jongnungs, Mugs; Nâm, Burm. and Assam, Carn. Coast.

Description.—Nearly of the size and shape of the English bull. It has short horns, which are distant at their bases, and rise in a gentle curve directly out and up; a transverse section near the base is one of his thickest parts; and the highest, being on the inside. The front is broad, and crowned with a tuft of lighter coloured long curled hair. The dewlap is deep and pendant. It has no mane nor hump, but a considerable elevation over the withers. The tail is short, the body covered with a tolerable coat of straight dark-brown hair; on the belly it is lighter coloured; and the legs and face are sometimes white. (Roxburgh.)

Habit, Locality, &c.—Dr. Buchanan states that the cry of the Gayal has no resemblance to the grunt of the Indian Ox; but a good deal resembles that of the buffalo. It is a kind of lowing, but shriller, and not near so loud as that of the European Ox. To this the Gayal, in Dr. Buchanan's opinion, approaches much nearer than it does to the buffalo. Mr. Macnair states that the Gayal is found wild in the range of mountains that form the eastern boundary of the provinces of Arakan, Chittagong (ChitQuag), Tipura, and Sylhet. The Côcôa, or Lunetas, a race of people inhabiting the hills immediately to the eastward of ChitQuag, have herds of them in a domesticated state. The animal is called Gayal in the Hindu Shava, but seems however to be little known beyond the limits of its native mountains, except to the inhabitants of the provinces above mentioned. The same author informs us that the Gayal is of a dull heavy appearance; but at the same time of a form that indicates much strength and activity, like that of the wild buffalo. Its disposition is gentle; even in the wild state on its native hills it is not considered dangerous, never standing the approach of man, much less sustaining his attack. The Côcôa hunt the wild ones for the sake of their flesh. The Gayal is a forest animal, and prefers the tender shoots and leaves of shrubs to grass; it never wallows in mud like the buffalo. It is domesticated by the Côcôa, but does not undergo any labour. The cow goes eleven (?) months with young, gives but little milk, and does not yield it long; but that little is remarkably rich, almost equaling cream, which it resembles in colour; the Côcôas however do not make any use of the milk, but rear the Gayal entirely for their flesh and skins, of which last, or rather their hides, they form their saddles. These herds roam free in the forests near their village during the day, but return of their own accord at evening, being early taught to do this by being fed when young every night with salt, of which these animals are very fond. The Hindus, in the province of ChitQuag, will not kill this Gayal (their Galógh) as they hold in equal veneration with the cow, but they hunt and kill another Gayal (A'l Gayal or Seloi) as they do the wild buffalo. The form of the animal, and the way in which it carries its head, will be understood from the following figure.

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Head of true or Assal Gayal (female), Bos Gaywal: S. E. Frontier of Bengal (from Hardwicke).
Mr. Harris, in his letter to Mr. Lambert, after identifying his animal with Mr. Lambert's drawing, writes thus:—

"The animal," which I have kept and reared these last seven years, and know by the name of the Gyall, is a native of the hills to the north-east and east of the Company's province of Chittagong, in Bengal, inhabiting that range of hills which separates it from the country of Astracan. The male Gyall is like our bull in size and appearance, but, I conceive, not quite so tall; it is of a blackish-brown colour; the horns short, but thick and strong towards the base, round which and across the fore the hair is bushy and of a dirty white colour; the chest and forehead are broad and thick. He is naturally very bold, and will defend himself against any of the beasts of prey. The female differs little in appearance; her horns are not quite so large, and her make is somewhat more slender; she is very quiet, is for all the purposes of the dairy, as also (I have been informed by the natives) for tilling the ground, and is more tractable than the Buffalo. The milk which these cows give has a peculiar richness in it, arising, I should conceive, from their mode of feeding, which is always on the young shoots and branches of trees in preference to grass. I constantly made it a practice to allow them to range abroad amongst the hills and jungles at Chittagong during the day to browse, a keeper attending to prevent their straying so far as to endanger losing them. They do not thrive in any part of Bengal so well as in the aforementioned province and in the adjoining one, Tipperah, where I believe the animal is also to be found. I have heard of one instance of a female Gyall breeding with a common bull.'

The species of Gyall thus described is a native of the hills and mountains in the country of Astracan, which is situated between the sea and the Caspian Sea, and is inhabited by the Persians. It is of a larger size than the wild ox, and has a richer and more flowing coat of hair. The horns are short, but thick and strong, and are carried horizontally over the head. The animal is very active and fleet of foot, and is frequently used in hunting, especially in the pursuit of the wild sheep and goat. It is also employed in ploughing and other agricultural work.

Dr. Trall remarks that the only animal which appears to have affinity with the Gyall is the Bos Genus of Culebrooke, but the very different form of its head, the presence of a distinct dewlap, and the general habit of the Gyaal or Gyall, distinguish it from the Gaur. Captain Rogers describes Dr. Trall that neither the descriptions in Mr. Culebrooke's communication nor the figure of the Gyaal that accompanies them had any greater resemblance to the Gaur than that general one which subsists between all the animals of this genus.

The species of Gyall form not so long as that of the Urene (Arnee or Arni). Back strongly arched, so as to form a nearly uniform curve from nose to base of tail when the animal stands still. This appearance is partly owing to the curved form of the nose and forehead, and still more to a remarkable ridge of bone to great thickness, which sides to seven inches above the general line of the back, from the last of the cervical to beyond the middle of the dorsal vertebra, from which it gradually is lost in the outline of the back. It was very conspicuous in the Gours of all ages, though it is not to be traced to the western breeds of the Indian cattle. It bears some resemblance to the rudge described as existing in the Gyaal, but the Gaur is entirely without a dewlap, of which there is no trace in either sex at any age. The tail bushy and of the tail bushy with a common bull.'

**Head of Gyall. ('Linn. Trans.').**

The Jungly-Gau, Bœuf des Jolonges of M. Duvaucel, Bos Sphintus of F. Cuvier, is considered to be identical with Bos frontalis of Lambert.

M. Duvaucel states that he believed for a long time that this oxen did not differ essentially from our domestic oxen, and that they were both varieties of the same species; but he had then only seen the specimens living in the menagerie at Barnackmore, whereas he had since hunted them at the foot of the Silhet mountains, and he found that they were as common and as much spread as the Buffaloes. But he adds that they seem more wild, though they are nevertheless easily domesticated, and yield abundance of the richest milk.

**Bos Gaur, Trall.**

Dr. Trall remarks that the only animal which appears to have affinity with the Gaur is the *Bos Genus* of Culebrooke, but the very different form of its head, the presence of a distinct dewlap, and the general habit of the *Gaijal* or *Gyall*, distinguishes it from the Gaur. Captain Rogers describes Dr. Trall that neither the descriptions in Mr. Culebrooke's communication nor the figure of the *Gaijal* that accompanies them had any greater resemblance to the Gaur than that general one which subsists between all the animals of this genus.

The *Bos Gaur* is a species of ox, found in the mountains of India. It is larger than the common ox, and has a richer and more flowing coat of hair. The horns are short, but thick and strong, and are carried horizontally over the head. The animal is very active and fleet of foot, and is frequently used in hunting, especially in the pursuit of the wild sheep and goat. It is also employed in ploughing and other agricultural work.

**Locality, Habits, Chase, Reproduction, &c.—The Gaur,** according to Captain Rogers, occurs in several mountainous parts of India, but is chiefly found in the Nilgiri Hills and in the mountains of Mysore. In the Nilgiri Hills, it is found in the higher elevations, where it is protected from its enemies by its strength and agility. It is a solitary animal, and is seldom seen except in pairs or small herds. It feeds on the leaves and shoots of trees, and is a great feeder on fungi. Its flesh is highly esteemed, and is considered to be the best of all the wild oxen of India.

* M. Lesson observes that M. Geoffroy found a row of accessory synapophyses (synapophyses uncinate processus), which are the spine of the vertebral back, and called by M. Geoffroy pre-epiglottal synapophysis.

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the animal, it appears, when hit faces his adversary ready to do battle. A short bellow, imitated best by the syllables (ghoragh), was the only cry heard from the Gour, and that so until after it had been wounded. August is the month in which the calf is generally dropped, and the period of gestation is twelve months. The large quantity of milk given by the cow is averred to be occasionally so rich as to cause the calf's death. The first year, the native name of the bull-calf is Paroteh; the cow-calf is called Parooteh, and the full-grown cow Gorun. The Goura herd together at parties varying from ten to twenty; they browse on the leaves and tender shoots of trees and shrubs, and also graze on the banks of the streams. In the cold weather the saul forests are their places of concealment, and the heat brings them out to feed in the green lawns and valleys. They do not, it seems, walk in swamp and mire like the Buffalo. If the natives are to be credited, the Gour will not brook captivity; even if taken very young, the mountain-calf drops and dies. (Edinburgh Philosophical Journal, vol. ii.)

General Hardwicke (Zoological Journal, vol. iii.) gives a figure of a pair of horns of the Bos Gour or wild bull of the mountainous district of Ramgur, and table-land of Sagolaota, from which our cut is taken. The gour to which they belonged was killed, as General Hardwicke believed, by the same hunting-party described by Captain Rogers, and they were presented to the General by the principal member of that party, the late Major Roughseide. These horns were 15 inches between the tips.

Horns of Gour. (Hardwicke.)

Bos Bubalus : Le Buffe of Buffon; Le Buffe d'Italie of F. Cavier.

Description.—Front elevated, and rounded, so that the charger has a concave appearance; horns black, separated widely from each other, with a projecting ridge anteriorly; dewlap but little developed; tail long and pendant; hide black, the hairs stiff and not numerous.

The tongue is very smooth in the buffaloies, instead of being covered with very rough horny papillae as in the oxen, and there is a difference in the male intromissive organ of generation.

The female buffalo goes longer with young than the cow; their milk is excellent, and they may be milked in the same way as a cow, notwithstanding some tales to the contrary.

Habits.—The buffalo is wild and fierce, lives in large herds in moist and marshy places, and delights to roll in the mire.

Geographical Distribution.—Asia generally, Africa, and southern Europe. In Italy, where it was introduced, it exists in the Ponine marshes.

The Bos Arni of Shaw and others, the Arne or Urna, no longer holds a place as a species, being considered, on good evidence, a variety of Bos Bubalus. Mr. Colebrooke, in his interesting paper on the Goyal (Bos Gaarum) above noticed, says, 'The Bos Arne of Kerr and Turton, notwithstanding the exaggerated description given on the authority of one British officer who met with one in the woods, in the country above Bengal,' is evidently nothing else but the wild buffalo, an animal very common throughout Bengal, and known there and in the neighbouring provinces of Hindustan by the name of Arna.'—Though neither fourteen feet high, as Mr. Kerr has stated, or rather as the officer on whose information he relied, had affirmed; nor even eight feet, as Dr. Turton, following Kerr's inference from a drawing, asserts; yet it is, says Mr. Colebrooke, 'a large and very formidable animal, conspicuous for its strength, courage, and ferocity.' (As. Res., vol. viii.)

The domesticated Asiatic oxen, or zebus, vary much in their size and the direction of their horns, but are generally distinguished by a fatty elevated hump below the neck and over the withers. They are to be found in the catalogues under the names of Bos Indicus, Exrul, and (more correctly) Bos Taurus, var. Indicus, Desm. and others.

The horns of some are short and subrect (Indian ox), in others comparatively long and pointed backwards, with an inclination to curve inwards, as in the more common breeds (Zebu). The ears of some are of ordinary size and position (Zebu); in others pendulous (Indian ox). The dewlap is more or less developed, in some very largely. Their colour varies from a light ash grey to a milk white, and their size from the stature of an ordinary bull to that of a large mastiff. Many of these varieties may be seen in the gardens of the Zoological Society in the Regent's Park. The limbs of all are deere-like and elegant. They 'are spread,' says Mr. Bennett, 'over the whole of Southern Asia, the islands of the Indian Archipelago, and the eastern coast of Africa, from Abyssinia to the Cape of Good Hope.'

In many parts of India the Zebu is placed under the saddle or harnessed to a carriage, and travels at an easy rate. It must have lost much of its fleetness, if the more ancient writers are to be credited; for they speak of fifty or sixty miles a day as its usual pace, whilst the moderns only allow it twenty or thirty. The beef is not bad, but is neither so sweet nor so good as that of the common ox, the hump almost excepted, which when well cooked is very delicate.

The Zebus bear a charmed life among the Hindus, who venerate them and hold their slaughter to be a sin; though they do not object to work them. There are however some particularly sanctified zebras who lead an easy life, wandering about the villages at their ease, and taking their pleasure and their food where they list, if not prevented by the contributions of the devout.

Stall and Horns of the Arnee.

Indian Ox (large variety).
African Oxen.

**Bos Caffer. The Cape Buffalo.**

**Description.**—Horns black, extremely large and flattened at their base, where they cover the front, having a direction from within outwards and downwards, and then again elevated at their point; ears rather pendant and covered by the horns; dewlap large and pendant; skin with harsh hairs an inch long of a deep brown or black color. Size great, and proportions massive.

**Locality.**—South Africa.

**Habits, &c.**—The Cape buffalo congregates in large herds. Thunberg and his companions came suddenly upon a mass of five or six hundred, which were grazing in a plain skirted by a wood. The beasts did not see the intruders till they came within three hundred paces, when the whole herd lifted their heads and stood at a gaze. After a while the buffaloes stopped their heads again to feed, and six of the party (three Europeans and three Hottentots), who carried muskets and were accompanied by others armed with javelins, marched up to them within forty paces, when the herd again lifted their heads and were saluted with a volley, which instantaneously dispersed them, leaving their wounded to follow as they could. One of these, an old bull, made the travellers fly, but fell before he reached the wood. This beast was very thick in the body, with short legs, of a dark grey colour, and almost destitute of hairs. But if a herd may be approached thus safely, a single outlying bull or a wounded one appears to be a most formidable antagonist. The author last quoted was botanising in a wood rather behind his companions, when Auge, the gardener of the expedition, who went first, suddenly encountered a large old male buffalo, which was lying down quite alone in a spot of a few square yards free from bushes. No sooner did the beast perceive the poor gardener, than he rushed upon him with a terrible roar. Auge turned his horse short round behind a great tree, so as to be in some measure to get out of the sight of the buffalo, which now charged straight towards the servant who fled in terror from him; but the animal, finding itself so terribly that it instantly fell on its back, with its feet turned up in air and its entrails hanging out, in which state it lived almost half an hour. In the mean time the gardener and servant had climbed up into trees for safety. Thunberg, intent upon his botanising, and with his ears filled with the rustling of the branches, in the narrow pass where he was, against his saddle and baggage, heard nothing of all this, though near. But the buffalo had not done yet. The servant had brought two horses with him for his journey. One of them, as we have seen, had been already dispatched; the other now stood just in the way of the buffalo as he was going out of the wood. As soon as the infuriated beast saw this second horse, he attacked it so furiously, that he not only drove its horns into the horse's breast and out again through the very saddle, but threw it to the ground with such violence that it instantly expired, and all the bones of its body were broken. Just as the buffalo was thus engaged with this last horse, Thunberg came up to the opening and beheld the frightful scene. The wood was so thick that he had neither room to turn his horse round, nor to get on one side; he therefore was obliged to take refuge upon a tree into which he climbed, leaving his horse to its fate. But the buffalo had satisfied its rage or did not distinctly see the new object, for after his second exploit, he turned suddenly round and went off. Thunberg found his companions half dead with fear, indeed the gardener was so affected that he could scarcely speak for some days after, and the two surviving horses were discovered shivering with fear, and unable to make their escape. (Travelers.)

Sparrman (Voyage to the Cape, vol. ii.) gives a graphic description of the shooting of one, and of the unquenchable spirit of the animal even in death. We can only find room for the final act of the tragedy. 'During his fall, and before he died,' writes Sparrman, 'he bowed down in a most stupendous manner, and this death-song of his inspired every one of us with no small degree of joy, on account of the victory we had gained: and so thoroughly steel'd frequently is the human heart against the sufferings of the brute creation, that we hastened forwards, in order to enjoy the pleasure of seeing the buffalo stagger through the great mass of death. I happened to be the foremost among them; but think it impossible ever to behold anguish, accompanied by a savage fierceness, painted in stronger colours than they were in the countenance of this buffalo. I was within ten steps of him, when he raised himself suddenly again on his legs. I had reason to believe, since I was at the time very much frightened; for before I could well take my aim, I fired off my gun, and the shot missed the whole of his huge body; and only hit him in the hind-legs, as we afterwards discovered by the size of the ball. Immediately upon this I fled away like lightning, in order to look out for some tree to climb up into.' The same author gives the following as the measurement of a buffalo. Length 8 feet, height 5 feet, and the horns about 3 feet long, the latter being 2 inches over. The distance between the points of the horns he states to be frequently 5 feet. They are black, and the surface to within about a third part of them, measured from the base, is very rough and craggy. A very lively account of a buffalo hunt by Bruce. He guesses the weight of a bull that he assisted in killing at nearer fifty than forty stone. The horns from the root, following the line of their curve, were about 52 inches, and nearly nine where thickest in circumference.

The Cape buffalo delights in wallowing in the mire, and when hunted by hunting throws himself into the first water he reaches.

The flesh is described by some as good and highly flavoured by others as ill-grained and coarse; the difference in these accounts is probably to be traced to the sex, age, and condition of the animals eaten. The rhinoceros-like huds is much sought after for harness, &c.

**American Oxen.**

**Bison.**

*Bison Americana.* (See the article *Bison.*)

Our readers have only to open almost any one of the numerous books of South American Travels for an account of the wild or half-wild cattle, and the foresters and cowherds and slaughtering them. Mr. Darwin (Journal of Researches in Geology and Natural History, 8vo. London, 1839) informs us that the great corral at Buenos Ayres, where the animals are kept for slaughter to supply food to this beastly eating population, is one of the most beastly worst sights. The strength of the horse, as compared to that of the bullock, is
quite astonishing: a man on horseback having thrown his lasso round the horns of a beast, can drag it anywhere he chooses. The animal having ploughed up the ground with its crouched legs, in vain efforts to resist the force, generally daisies at full speed to one side; but the horse immediately springs to its feet, and so firmly that the bullock is almost thrown down, and one would think, would certainly have its neck dislocated. The struggle is not however one of fair strength, the horse’s girth being matched against the bullock’s extended neck. In a similar manner a man can hold the wildest horse, if caught with the lasso just behind the ears. When the bullock has been dragged to the spot where it is to be slaughtered, the mudder with great caution cuts the hamstring. Then is given the death-blow: a noise more expressive of fierce agony than any I know. I have often distinguished it from a horse, for even in a distant distance, and have always known that the struggle was then drawing to a close. The whole sight is horrible and revolting, the ground is almost made of bones; and the horses and riders are drenched with gore. The same interesting writer gives an account of the chase of a wild fat cow in the Falkland Islands with the bolos and lasso, nor does he forget to celebrate the delicious supper of ‘carne con cuero’ which it afforded him. A large circular piece was taken from the back, roasted on the embers with the hide downwards, and in the form of a sauce, so that none of the gravy was lost. The flesh thus treated was as superior to common beef as venison is to mutton.

Ovisbo.

Generic Character. — Horns very wide, and touching each other at their base, then applied to the sides of the head, and having the points suddenly turned up. No expanded muzzle; but no furrow on the upper lip. Chanfrein narrow at the end, very square, resembling that of the sheep. Ears short. Limbs robust. Tail very short.

Musk Ox: Ovismoschus moschatus.

Ovis moschatus.

Description. — Size of Highland cattle. Horns broad at the base, covering the brown and white crown of the head, and touching each other throughout from before backwards. At each horn rises from its flat convex base, it becomes round and tapering, curving directly downwards between the eyes and the ear, until it reaches the angle of the mouth, where it turns upwards in the segment of a circle to above the level of the eye; for half its length it is dull, white, and rough, and beyond smooth and shining; near the point it becomes black.

General color of the hair brown, long, matted, and rather curled on the neck and between the shoulders, where it is thicker, grizzled, on the back and hips long but lying smoothly. On the shoulders, sides, and thighs it is so long as to hang down below the middle of the leg. There is on the centre of the back a streak of a solid, dull brownish-white, called by Captain Perry the saddle. On the throat and chest the hair is very straight and long, and, together with the long hair on the lower jaw, hangs down like a beard and dewlap. The short tail is concealed by the fur of the body.

There is a large quantity of fine brownish ash-colored wool or down among the hair covering the body. The hair on the legs is short, dull brownish-white, unmixed with wool. The hoofs are longer than those of the Caribou, but so similar in form that it requires the eye of a practised collector to distinguish them. The species is small, and is smaller than that of bull, the horns are smaller, and their bases, instead of touching, are separated by a hairy space. The hair on the throat and chest is also shorter. (Richardson.)

This is the Bovif musqut of Jeremie; Musk Ox of Drage, Dobbs, Ellis, Pennant, Hearne, and Perry; Bos moschatus of Gmelin, Sabine, and Richardson (Perry’s Second Voyage); Matehe-mossotus (ugly bison) of the Cree Indians; Adsadak-guutut (little bison) of the Cheyewana and Copper Indians; and Domlingkuch of the Eskimoa. (Richardson.)

Geographical Distribution. — The barren lands of America lying to the northwest of the 60th parallel. Tracks were once seen on the land of the northern shore, in lat. 69°, by Capt. George Churchhill, in lat. 69°; and he saw many in his first northern journey, in about lat. 61°. Dr. Richardson was informed that they do not now come so far to the southward even on the Hudson’s Bay shore; and he adds that farther to the southward they seem to have disappeared. There has been stated by some observers as late as lat. 67°, although from portions of their skulls and horns, which are occasionally found near the northern borders of the Great Slave Lake, he thinks it probable that they ranged at no very distant period over the whole country lying between that lake and the west of Hudson’s Bay. He had not heard of their having been seen on the banks of Mackenzie’s River to the southwestern end of that lake, although they existed in numbers on its northern portion. They range, continues the Doctor, over the islands which lie to the north of the American continent, so far as Melville Island, in lat. 75°, but they do not, like the rein-deer, extend to Greenland, Spitzbergen, or Lapland. From Indian information we learn that there is a species of Dawn Island which skirt the Mackenzie, there is an extensive tract of barren country, which is also inhabited by the musk-ox and rein-deer. It is to the Russian traders that we must look for information on this head; but it is probable that, owing to the mildness of the climate to the westward of the Rocky Mountains, the musk-ox, which affects a cold barren district, where grass is replaced by lichen, does not range so far to the southward on the Pacific coast as it does on the shores of Hudson’s Bay. It is not known that there is a division of islands lies between Melville Island and Cape Lyon, or that Wollaston and Banks’ lands form one great island, over which the migrations of the animals must have been performed. The districts inhabited by the musk-ox are the eastern part of the Eskimoa, on the northern side of the great Canadian lakes, nor the Crees have an original name for it, both terming it Bison with an additional epithet.

Habits, Chase, Utility, &c. — Dr. Richardson, who had the best opportunities of coming at the truth, informs us that the country is covered by low shrubs, and the rocky and destitute of wood, except on the banks of the larger rivers, which are more or less thickly clothed with spruce trees. Their food, he tells us, is similar to that of
the Caribou (Deer, vol. viii., p. 355), grass at one season
and lichens at another; and the contents of its
pouch are eaten by the natives with the same relish
as that with which they devour the 'norrooks' of the Caribou. The dung is
voided in round pellets, which are larger than those which
come from the Caribou. The animal runs fast, short as
are its legs, and hills and rocks are easily climbed by this
ox of the northern deserts. One pursued by Dr. Richar-
don's party on the banks of the Copper-mine River scaled a
lofty sand-cliff with so great a declivity, that they were
obliged to crawl on hands and knees to follow the chase.
The musk-oxen assemble in herds of from twenty to thirty,
are in their rut about the end of August and beginning of
September, and bring forth one calf about the latter end of
May or beginning of June. Hearne accounts for the few
bulls which are seen by supposing that they kill each other
in their contests for the cows.

Dr. Richardson thus graphically describes the terror of
a huddled herd. 'If the hunters keep themselves concealed
when they fire upon a herd of musk-oxen, the poor animals
mistake the noise for thunder, and, forming themselves into
a group, crowd nearer and nearer together as their com-
panions fall around them; but should they discover their
enemies by sight, or by their sense of smell, which is ver-
y acute, the whole herd seek for safety by instant flight. The
bulls however are very irascible, and, particularly when
wounded, will often attack the hunter, and endanger his
life unless he possesses both activity and presence of mind.
The Esquimaux, who are well accustomed to the pursuit of
this animal, sometimes turn its irritable disposition to good
account; for an expert hunter having provoked a bull to
attack him, wheels round it more quickly than it can turn,
and by repeated stabs in the belly puts an end to its life.'

Mr. Jeremie, who first brought the animal into notice,
carried some of its wool to France, where some stockings
were made of it, said to have gained the finest silk.

Dr. Richardson says that this wool resembles that of the
Bison, but is perhaps finer, and would, in his opinion, be
highly useful in the arts, if it could be procured in sufficient
quantity. The same author informs us that when the ani-
mal is fat, its flesh is well tasted, and resembles that of the
Caribou, but has a coarser grain. The flesh of the bulls is
high flavoured, and both bulls and cows, when lean, smell
strongly of musk, their flesh at the same time being very
dark and tough, and certainly far inferior to that of any
other ruminating animal in North America. The carcass of a
musk-ox weighs, exclusive of the offal, about three
hundredweight, or nearly three times as much as a Barren-
ground caribou, and twice as much as one of the woodland
caribou. (Fauna Borealis Americana.)

Utility to Man.—The true oxen hold the first rank
among the animals which are useful to man. The domes-
ticated varieties, in their life and in their death, minister
largely to his wants. From the earliest times we find it in
the homestead; and there is scarcely a part of the animal,
from horn to hoof, when dead, that is not available for his
use. It is not then a subject of wonder that in the dark
ages the ox should have been considered as the representa-
tive of the Deity, and that India and Egypt should have
venerated the form as that of a god.

Fossil Oxen.

Remains of oxen and deer occur abundantly in the third
and fourth periods of the tertiary series (Pliocene of Lyell),
with extinct species of existing genera of Pachydermata,
such as elephant, rhinoceros, hippopotamus, and horse,
and the extinct genus Mastodon; and large Carnivora, e.g.,
tiger, hyena, and bear.

At the head of these we must place Bos primigenius.
Mr. Woods, in the paper which we have above alluded to,
remarks that 'it has occasioned some speculation among
zoologists to appropriate to the large herbivorous animals,
of which these skulls and scattered bones are now the
only vestiges, their proper place in the system of nature. Cow-
however has fixed their characters, and has declared them
to resemble the skulls of the present oxen so closely, that
there can be little doubt of their having belonged to the
stock from which the latter have all proceeded; these hav-
ing however degenerated in size, and varied from them and
from each other in minor points, owing to differences in
climate, food, and other causes depending upon domestic-
tation, their magnitude is at least one-third greater than
that of the largest breed of modern oxen, and their horns
are much more massive.'
Cuvier, like Linnaeus, places Bos, consisting of the True Oxen and the Musk-Ox (Ovibos), next to Osus, and at the end of the Ruminants, Mr. Gray makes the Bosivide the first family of his fifth order, Ungulata of Ray, and divides that family as follows:

**Horns none or deciduous.**


Fischer (J. B.) arranges Bos at the end of the Ruminants, having it next to the Ungulata.

Col. Hamilton Smith, who has paid great attention to the family, has published his views, which are well worthy of the attention of zoologists, in Griffith's 'Cuvier,' to which we refer the reader. Mr. Swainson has adopted them in his recent work.

The latter zoologist (1835) makes the Bosivide, its first family of the Ruminantes, or ruminating quadrupeds, consist of the following genera:—Catoletp, Osibos, Bos, Bubalus, Bizon, Taurus, Sm., Anoa, Sm.: indeed the initial letters of Col. Smith's names stand at the head of each of the genera. The genus Anoa is placed by Col. Smith under his family Caprida, a situation which Mr. Gray also assigns to it.

Mr. Ogilby's 'Bosiva' forms the fifth and last family of the Ruminantes, and include the following genera:—Tragulus, Sylirepula, Tragelaphus, Calliope, Kemos, Capricornus, Bubalus, Oryz, B. (type B. Taurus). The genus Osibos is arranged by him under the preceding family, Capridae (Zool. Proc., 1875).

**OX-ENE. [TRIMMIE.]**

OXALIC ACID. This acid was discovered by Scheele, in 1776. It occurs in several plants, as in the wood sorrel (Oxalis acetosella), and in common sorrel (Rumex acetosa). In the juice of these plants, and in the roots of rhabarbar, bistort, gentian, &c., it is combined with potash; in several kinds of lichens, it is found in union with lime. It occurs as a mineral compound also, in combination with oxide of iron, and is called Humboldtite. It is an ingredient also of several urinary calculi.

Oxalic acid may be obtained by several processes: first, by decomposing the natural superoxalate of potash, or salt of sorrel, by means of acetate of lead, sulphuric acid, &c.; but it is best obtained by heating organic matter, such as sugar or potato starch, with nitric acid in a retort, or in which acid has been first obtained from sugar, it received the name of succinuronic acid. Indeed most organic compounds which contain much carbon and no azote, may be converted into oxalic acid by the action and decomposition of the nitric acid; and in cases of potash, produces similar results. When nitric acid acts upon sugar or starch, it is decomposed, and yields nitric oxide gas in great quantity; the oxygen of the decomposed acid uniting with the carbon of the vegetable matter, converts it into oxalic acid: the crystals first obtained are to be dissolved in water and re-cristallized to render them perfectly pure.

The properties of oxalic acid are, that its crystals are prismatic, colourless, and transparent; the primary form is a right rhombo prism. Their taste is extremely sour, and they are very poisonous when dissolved in water. Having it next to the weight of their water, the solution reddens litmus paper. When this acid is exposed to a dry air, it effloresces, losing water of crystallization; it dissolves in 15 parts of water at 50°, and in 9 parts at 60°; at 212° it melts in its water of crystallization; it is soluble also in alcohol, but less so than in water.

Oxalic acid consists of, in its anhydrous state,—

| Three equivalents of oxygen | 24
| Two equivalents of carbon | 12

Equivalent: 4.36

So that it is equal to

1 equiv. of carboonic oxide = 14 = 8 oxygen + 6 carbon.

1 ditto of carboonic acid = 35 = 16 + 19.
No means have yet been discovered of forming oxalic acid by combining carbonic acid and carbonic acid; but when oxalic acid is heated with sulphuric acid, it resolves itself into these substances entirely and in the proportions stated, the water of crystals combining with the sulphuric acid.

Oxalic acid, in the state of crystals, consists of one equivalent of acid and one equivalent of water; the acid cannot be totally expelled by heat; the acid, unless combined with a base, always retains one equivalent of water.

Oxalic acid is a certain extent volatile, and Mr. Forsay has shown that in a mixture taken place when at common temperatures; at 212° the volatilization is much more considerable; and when deprived of two-thirds of its water of crystallization, it sublimes rapidly and without decomposing; the sublime is crystalline, and contains one equivalent of water.

When oxalic acid retaining the whole of its water of crystallization is suddenly heated up to about 300°, it yields carbonic acid, carbonic oxide, formic acid, and water.

Oxalic acid forms compounds with bases, which are termed oxalates, and of these we shall describe some of the more important.

**Oxalate of Ammonia.**—This salt is prepared by adding the sesquicarbonate of ammonia to a solution of the acid, to saturation. The solution by evaporation readily yields slender yellow bipyramids; the acid crystals, and the form of which appears to be a right rhombic prism. They are inodorous, but have a sharp saline taste. One hundred parts of cold water dissolve 45 parts of this salt; in hot water it is much more soluble. Alcohol does not take it up. When decomposed by heat, it yields the peculiar compound. [Oxalate of Ammonia] This salt is composed of

- One equivalent of oxalic acid... 36
- One equivalent of ammonia... 17
- One equivalent of water... 9

Equivalent... 62

It is employed in solution as a test of the presence of lime.

**Oxalate of Ammonia** may also be formed, but it is not of importance.

**Oxalate of Potash.**—Oxalic acid forms three salts with potash: the neutral oxalate is obtained by saturation the acid with the alkali. It crystallizes in flat rhombic crystals, which are so very soluble in water, that even when cold it takes up half its weight. When a solution of oxalic acid is added to this, precipitation of a less soluble supersaturation occurs. It is composed of

- One equivalent of oxalic acid... 36
- One equivalent of potash... 58
- One equivalent of water... 9

Equivalent... 93

**Bisulphate of Potash** may be prepared either by digesting the requisite quantities of acid and alkali in water, or, as above mentioned, by adding oxalic acid to the neutral salt. It forms small rhombic crystals, which have a bitterish taste and an acid reaction, and they are soluble in about 10 times their weight of cold water. This salt, mixed with the quadrLOCAL.oxalate, exists in *oxalaeacetatul*, and they constitute the compound known by the name of the salt of sorrel, employed for removing ink-spots.

**Oxalate of Soda** may be prepared by digesting the binauleate in hydrochloric acid, which taking half the potash, the other becomes quadr-local. The crystals are prismatic, and are as little soluble in water as those of the bisulphate.

The oxalates of potash are all converted by a red heat into carbonates of potash; their composition was first ascertained and pointed out by Dr. Wallaston as follows:—and but also as one of the most remarkable series of proofs of the doctrine of multiple proportions.

**Oxalate and Binauleate of Soda** may be formed, but they are not employed.

**Oxalate of Lime** is a very insoluble compound, and hence oxalic acid and lime, with certain restrictions, are used as tests of each other's presence. Barites and strontis also form insoluble compounds with oxalic acid. Such metallic oxalates as are important are noticed under the respective metals.

**Oxalic Acid**, the most highly oxygenated of all the vegetable acids, is also the most rapid and certainly fatal of any which are capable of being crystallized. As the crystals are small, the sulphate of magnesia, Epsom salts, mistakes between the powers of very frequent occurrence. Being likewise much used in the arts, and commonly known by the name of acid of sugar, it is taken either accidentally, or under the supposition that it is akin to sugar, and is not a deadly poison. 375° or 383°.

To prevent confusion of the crystals of this formidable acid with those of the sulphate of magnesia, it has been proposed that the former should be coloured while in the course of preparation, an expedient which has not been adopted. But on the other hand, the crystals of Epsom salts have been manufactured of a different shape by a peculiar process of crystallization. The taste is very different, a solution of oxalic acid being intensely sour, while that of sulphate of magnesia is extremely bitter. Attention to this point, in combination with a small taste of alum, makes the identification obvious. Oxalic acid not only acts with violence, but produces nearly the same effects to whatever texture of the body it is applied. The concentrated acid, if taken in considerable dose, may cause death in from two to twenty seconds; for soluable salts with the acid is found to contain black extravasated blood, exactly like blood acted on by oxalic acid out of the body; the inner coat of the stomach is of a cherry-red colour, with streaks of black granular warty extravasation; and in some places the surface of the liver is also black, and the kidneys are greatly infected. Such are the effects of the concentrated acid. When considerably diluted, the phenomena are totally different. When dissolved in twenty parts of water, oxalic acid, like the mineral acids in the same circumstances, causes to protrude, but has no other effects; they may, in fact, cause death by acting indirectly on the brain, spine, and heart. The symptoms then induced vary with the dose. When the quantity is large, the most prominent symptoms are those of palsey of the heart; when less, its violent tremulousness; in less; the pains in the head, together with the constipation, and death occurs under symptoms of pure narcotism, like those caused by opium. Very few persons have recovered when the quantity taken was considerable. (Oxalic acid of lime.)

To counteract the very rapid effects of this poison, the most prompt treatment is necessary. Chalk, magnesium, or even the plastron of the water diffused through water, should be given without delay. The other alkalis are impervious. We have no instance of the effects of alkaline oxalic acid, an example of a poison which acts through all its soluble chemical combinations. Emetics may be given, if vomiting has not spontaneously taken place; but it is highly inexpedient to give much warm water, as dilution only facilitates the absorption of the poison, and induces its remote but equally fatal effects.

Notwithstanding the formidable properties of this acid, the agreeable cooling effects it displays have led to its employment in the form of lozenges, or in a dilute solution. In the French custom formerly, in France, it is used to quench thirst, and allay the heat of the stomach, which prevails towards the later stages of consumption. But for this purpose citric acid or lemonade is preferable, as well as safer.

Besides the immediate danger from an over-dose, there is yet a remote source of risk which requires notice. Oxalic acid exists in many vegetables, in combination with lime or potash, or free, as in the case of the eier aeusticum. Many of these plants are used in different parts of the world. The effect of the abuse was first noticed by Dr. Wallaston and pointed out by Dr. Wallaston as the cause of death in a case occurring in France, it is used to quench thirst, and allay the heat of the stomach, which prevails towards the later stages of consumption. But for this purpose citric acid or lemonade is preferable, as well as safer.

**Oxalic Acid** is prepared by causing the acid to combine with the ether in its nascent state: for this purpose equal weights of oxalic acid and alcohol are distilled with twice their weight of sulphuric acid. At first alcohol, and then ether, which collects as an oily liquid at the bottom of the receiver; this is repeatedly washed with water, and then boiled with lathams till its boiling-point attains 360°; by this the excess of
OXA

is separated; and the oxalic ether, having been poured off, is to be redistilled.

The properties of this ether are, that it is of an oily appearance, has an aromatic mixed with an allaceous odour; its specific gravity at 40° is 1.0292, and it boils at 362°. It dissolves sparingly in water, and the solution is neutral to test papers: with alcohol it combines in all proportions: it yields oxalic acid by spontaneous decomposition, and by the alkalis is converted into oxalic acid and alcohol. It is composed of:

One equivalent of oxalic acid . . . . 36
One equivalent of ether . . . . . . . 37

Equivalent 73

OXALIDA C.E.R.E. are polycephalous exogenous plants with a superior ovary, a small number of hypogynous stamens, which are usually monodelphous, and distinct styles. Their fruit contains five cells, in which there are numerous seeds, occasionally expelled with violence by a sudden contraction of the sides of the carpel. The order is so very nearly allied to Geraniaceae that it can hardly be considered distinct. The genus Oxalis itself is called Wood-sorrel, from the acidity of the leaves and the natural habitation of the European species in a wild state; it is however most common at the Cape of Good Hope, where the species are extremely ornamental. In the East Indies the genus Averrhoa produces a fruit (the Carambola or Blimbing), used for pickling and preserving; but its extreme acidity renders it unsuitable to many persons. Our Oxalis Acetosella, or common Wood-sorrel, has been supposed to be the true Shamrock of the Irish, instead of the trefoil to which the name is more commonly applied. In the tropical parts of India is an annual Oxalis, called O. sensilata in consequence of its pinated leaves being irritating like the sensitive plant; it has been lately ascertained that the European trefoil-leaved species have the same property, only in a more feeble degree. (Bulletin de l'Academie Royale de Bruxelles, vol. vi., No. 7.) This phenomenon is most conspicuous in a hot sunny day.

OXALIDE, or OXAMIDE, is obtained by heating oxalate of ammonia in a retort, and also by some other processes. The oxalate of ammonia is decomposed; ammoniacal, carbonic acid, carbaminic oxide, and cyanogen gases being evolved: in the neck of the retort, and on the water in the receiver, a dirty white substance is deposited; this is oxamide, which is to be purified by washing with water. Oxamide is composed of:

Two equivalents of carbon . . . . . 12
Two equivalents of oxygen . . . . . 16
Two equivalents of hydrogen . . . . . 2
One equivalent of azote . . . . . . . 14

Equivalent 44

It will be seen on examination that it is formed by separating the elements of one equivalent of water = 9 from one equivalent of oxalate of ammonia = 53. Although it contains neither oxalic acid nor ammonia, yet, when boiled with a solution of potash, ammonia is evolved, and oxalate of potash formed; it appears therefore that it resuses oxygen and hydrogen by decomposing water, owing to the influence of the alkali. With sulphuric acid corresponding results are obtained; carbonic acid and carbaminic oxide gases are evolved, and sulphate of ammonia is formed.

The properties of oxamide are, that it is a pungent, insipid, insoluble in cold water; but boiling water dissolves it, and on cooling, flocculent crystals of a dirty white colour are deposited. When moderately heated, it sublimes uncharged; but when quickly heated, it is decomposed, yielding carbaminic oxide and a bulky oily residue. The acids do not alter it, but with strong acids it suffers the change already described.

The production of this substance, and the reproduction of oxalic acid and ammonia, have given rise to some general views which have been so ably set forth by Dumas. (Théorie des Amides; Chimie appliquée aux Arts, t. v. p. 84.)

OXENSTIERN, AXEL, COUNT, born in 1583, of a noble Swedish family, studied in Germany at Rostock, Jena, and Wittenberg. In 1603 he entered the law, and in 1608 he took degrees. After his return to Sweden, he followed the career of a diplomat and a man of state under Charles IX., and was made a senator. When Gustavus Adolphus ascended the throne in 1611, he appointed Oxenstierna chancellor or prime minister. From that time to the time that monarch ministerial dignity in Sweden was complete, and it was to him that his illustrious master, whose confidence he fully enjoyed, and to whom his abilities as a statesman were of the greatest service. After the death of Gustavus, at the battle of Lutzen, in 1632, Oxenstierna, who was then on a mission in another part of Germany, immediately returned to the camp, concentrated the Swedish and allied forces, urged the German princes to remain steady in the cause of the alliance against the political and religious tyranny of the emperor Ferdinand, and having received full powers from the senate of Sweden, he became the soul of the Protestant league in Germany. The difficulties which Oxenstierna had to encounter proceeded from the jealousy of his allies more than from the efforts of the enemy. He succeeded however in assembling the States of Lower Saxony at Heilbron, and he opened the council by a speech, in which he said that, in order to avert the danger, he obtained a supply of money for the Swedish army, and he was himself acknowledged as the head of the league. A succession of able commanders, the Duke of Weimar, Banner, Torstenson, Wrangel, all formed in the school of Gustavus, led on the Swedish and German armies to various success, while Oxenstierna directed from Stockholm the diplomatic negotiations, until the peace of Westphalia, in 1648, put an end to the Thirty Years' War. Count Oxenstierna's son was one of the Swedish envoys who signed that celebrated treaty. It was to him that the chancellor, in reply to the young man's letters, in which he had expressed himself with great difference in consequence of his inexperience in matters of state, wrote the following sentences, which has become proverbial: ' Nescis, mi fili, quinquies prudentia homines reguntur' (You do not know yet, my son, how little wisdom is exhibited in ruling mankind).

Oxenstierna was at the head of the regency of Sweden during the whole minority of Queen Christina, and he continued to be prime minister after she had assumed the reins of government. He strongly opposed Christina's intention of abdicating the crown, and being unable to prevent this act, he withdrew from public life. Christina's successor, Charles Gustavus made use of him on various occasions. Oxenstierna died at Stockholm, in August, 1654, regretted and honoured by all Sweden. He is said to have been partly the writer of the 'Historia Belli Sueo-Germanici,' published by Chomitz, and also of the work 'De Arcanis Astronomiae ab Homero usque ad Lapide.'

Oxford. City. [OXFORDSHIRE.]

OXFORD, Bishopric. [OXFORDSHIRE.]

OXFORD UNIVERSITY. The origin of the University of Oxford is unknown. It is agreed upon among the ablest investigators that although this University is by many considered to have been the most highly esteemed, and by the age of any satisfactory records, the illustrious Saxon king, who is generally said to have founded or restored it, really did nothing of the kind. No document or well-authenticated history can be produced
in which the name of Alfred appears as a benefactor to this University. It is certain however that Oxford was a place of study in the reign of Edward the Confessor, if not earlier.

The first places of education in Oxford appear to have been schools for the instruction of youth. These schools were either claustral, that is, appendages to convents and other religious houses; or secular, such as were kept by, or hired and rented of, the inhabitants of Oxford. When many of these secular scholars resided in one house, it got the name of a college. (Collatvli, formed, there are not yearbooks, and governors or principals were appointed to superintend the discipline and the affairs of the house. But it does not appear in what respects the education in these halls differed from that in religious houses, which were the oldest places of education in Oxford. The school Master at the Chirch- orcan-schools, sophistry-schools, schools for arts, medicine or physic schools, law-schools, divinity-schools, &c. It is difficult to discover any traces of a regular plan of education in Oxford before the foundation of the first college by Walder de Marre. The founder of this college is well digested: and they have been adapted with little alteration to succeeding times in other colleges as well as his.

A remarkable fact in the early history of Oxford has only been put in a clear light of late years, and that by the industry of German scholars. In the reign of King Stephen, Vacarius, a Lombard by birth, established a school of Roman law at Oxford. Stephen after a time attempted to suppress all instruction in the Roman law but we are informed that his attempt was not successful. It is supposed that it happened that the school of Roman law was still maintained; but it was not put down at once, and it appears very probable that it subsisted for some time after the death of Vacarius. The pupils of Vacarius were numerous, and as many of them were poor, he prepared for their use (about the year 1149) a work on Roman law in nine books, which was extracted from the Pandects and the Code. The learned John of Salisbury was the friend of Vacarius, and though Roman jurists were not one of his favorite studies, he was not the chief of them, he was competently acquainted with Roman law, and doubtless indebted for his acquaintance with it to the Oxford school of Vacarius. (Savigny, Geschichte des Römischen Rechts im Mittelalter, 4ter band; Wanch, Magistratsrecht der Litany, 1850.)

Various accounts are given of the number of students at Oxford in the reigns of the early Norman kings. In the time of Henry III., we are told by Wood in his Annals (vol. i., p. 206) that they amounted to thirty thousand; and even when this sum is considered as an underestimate, it is said, on the authority of students, who are a numerous body; for there is no doubt that the University was then frequented by a great number of students, and many foreigners resorted to it from Paris and other places.

The earliest charter of privileges to the University of Oxford was granted by the 28th Hen. III. (Pat. 28 Hen. III., m. 6, "Libertates concessae Cancellario Universitatis Oxoni.") It was followed by charters, some of fresh privileges, and others of general confirmation of the privileges formerly granted, in the 39th Hen. III., a. d. 1292, and in the 18th Edw. III., 1344; in the 17th and 33rd Edw. III.; in the 1st Hen. V.; 37th Hen. VI.; and 15th Hen. VIII.

The last confirmation was in the 13th Elizabeth, in the 'Act concerning the several Incorporations of the Universities of Oxford, Cambridge, and of the establishment of the Charters, Liberties, and Privileges granted to either of them.'

The Cottonian MS. in the British Museum, Claud., D. viii., contains an ancient copy of the statutes, privileges, and other ancient documents of the University, copied in the fifteenth century, a beautiful manuscript. Another MS. in the same collection, Faustina, C. vii., contains an enumeration of the titles of all the charters granted to the University, whether of general or individual privilege, from the time of Henery III. to 1591, which is a valuable work.

The regulation of the assize of bread and beer, and the supervision of weights and measures, were granted to the chancellor of the University by Pat. 32 Edw. III., m. 5.

The same jealousy of the authority of the University which existed in early times among the townsmen of Cambridge, prevailed at Oxford also. The quarrels between the scholars and the townsmen often broke out into open violence, sometimes accompanied with bloodshed. Matthew Paris makes mention of these riots as early as 1240. (See Wood's Annales, vol. i., pp. 231, 237, 262, 367, 412, 456.) On several occasions the scholars quitted the University for a time. At one period they retired to Northampton, at another to Stamford. The most serious riot on record was on the day of St. Scholastica the Virgin, Feb. 10th, 1324, when two brothers of the University were cloutted, and the clerks and others killed in the conflict; and that the mayor for the time being, the two bailiffs, and three score of the chiefest burghers, should personally appear on the said day in St. Mary's Church at mass, and offer at the great altar a pen, the choirs. The mayor and some of the commons at the same time gave a bond to pay a hundred marks yearly to the University, as a compensation for the great losses occasioned by the fray; but the bond was not to be enforced long as the mayor and sixty-two burghers came yearly and performed this pittance. The mayor was confirmed in a charter of inapexius by King Edward III. (Pat. 31 Edw. III., p., m. 26.) After the Reformation, this custom having been neglected in the beginning of Queen Elizabeth's reign for fifteen years, the University sent the mayor for Lincoln, but the mayor answered, that their penalty was in the bond of a mass, which was against law. The lords of the queen's council however, before whom the case was finally brought, in her majesty's eleventh year, having discharged the city from the arrears, ordered that in future the number of citizens should, on St. Scholastica's day, attend a sermon or communion at St. Mary's, offering each a penny at the least. This was subsequently changed to attending at the ordinary service: the offer of a sermon has been made immediately after the Litany, which, for that purpose, was read at the altar. It continued, with now and then an intermission (the citizens being always anxious to get rid of this pittance), till 1823, in which year, on Feb. 1st, in full convocation, the University was affixed to an instrument which entirely released them from its observance.

This University has been long governed by statutes, or bye-laws, made at different times, and confirmed by the charters of the kings of England. Those at present in force were confirmed by King Charles I., in 1635. The incorporation of the University is styled 'the chancellor, masters, and scholars of the University of Oxford.'

The principal officer is the chancellor. In the thirteenth century the chancellor was styled the master or president of the schools, and appears to have derived his authority from the bishops of Lincoln, who were then the diocesans of Oxford. The bishops confirmed, while the regents and non-regents nominated, the chancellor; but after the reign of Edward III., the chancellor was nominated by the regents and non-regents. After 1571, only the regents and non-regents nominated, the chancellor; but after the reign of Edward III., the chancellor was the regents and non-regents. Only at first the election was for one, two, or three years; but afterwards for life. Still however the person chosen was a resident member of the University, and always an ecclesiastical until the time of Sir John Masefield, who was chosen in 1685, was afterwards conferred, at the pleasure of the convocation, upon ecclesiastics or laymen. Since the time of Archbishop Sheldon, in 1667, it has only been conferred upon men of distinction who have been members of the University.

The chancellor's deputy was formerly styled vice-chancellor or commissary, but for a long time past he has been styled vice-chancellor. His office is annual, though generally for the term of ten years. For three years for the chancellor is nominated by the chancellor, on the recommendation of the heads of colleges, and appoints four deputys, or pro-vic-chancellors, who must likewise be heads of colleges. During the vacancy of chancellor however, the office is executed by the provost, theologus, or cancellarius notis, resident in the University.

The seneschallius, or high steward, is appointed by the chancellor, and approved by convocation. The office is for life. The high steward assists the chancellor, vice-chancellor, and provosts in the execution of their respective
This measure was opposed by the House of Commons, but ably supported by Sir Edward Coke. The members are chosen by the vice-chancellor, doctors, and regent and non-regent masters in conversation.

The following are the colleges of Oxford, with the dates of their respective foundations:—University College:—it was founded in 1536; University College was founded in 1560; New College, in 1568; Lincoln, 1427; All Souls, 1437; Magdalen, 1456; Brasenose, 1474; Christ-Church, 1525; Trinity, 1554; St. John's College, 1555; Jesus College, 1571; Wadham, 1613; Pembroke College, 1624; Worcester, 1714; St. Edmund Hall, soon after 1269; St. Mary's Hall, 1332; New Inn Hall, 1392; Magdalen Hall, 1457; St. John's Hall, soon after 1457. It may not be unnecessary to remark that the colleges are corporate bodies belonging to the class called elemenary colleges, and are quite distinct from the corporation of the University. The common opinion, they are often confounded; a mistake which the dicta of prominent judges (Lord Mansfield for instance), and still more the actual mode of administering the affairs of the University at present, has chiefly contributed to create and maintain.

[See also the They, ch. 3, 11.

The buildings belonging to the University of Oxford are:—

1. The Schools, with the Bodleian Library. The Divinity School, with the room above forming part of the Bodleian, and the Library, with the Chapel. The Bodleian School, with the remainder of the Bodleian, early in the seventeenth century, by Thomas Holt, of York, who is supposed to have been the architect of Wadham College, and of the new quadrangle of Merton, both built about the same time. The Bodleian Library was first laid open to the public on Nov. 8th, 1602. Attached to it is the picture-gallery of the University.

2. The Theatre, built by Gilbert Sheldon, archbishop of Canterbury and chancellor of the University, in 1663, as a place of public entertainment. At first intended for the housing and purchase of the ground on which it stands; 100l. per annum for the purchase of books, and 150l. per annum for the librarian. James Gibbs, a native of Aberdeen, was the architect. The foundation-stone was laid June 16, 1737, and the building was completed during the reign of George II. It was opened to the public by the ceremonies of the trustees of Dr. Radcliffe's will. It has been appropriated by a late resolution of the trustees to the reception of books in medicine and natural history. In the area of this library a few antique marbles are deposited, with a collection of casts from the best statues of antiquity. Here also is preserved the Coss collection of specimens of the marbles employed in the ornamental architecture of both ancient and modern Rome.

3. The Ashmolean Museum, built at the charge of the University in 1683.

4. The Clarendon, completed in 1712, partly from the profits arising from the sale of Lord Chancellor Clarendon's History of the Rebellion, the copyright of which was given to the University. The printing for the University was carried on in this building from 1713 to 1830, when it was removed to the newly-erected printing-house. The base-stone of the Clarendon contains at present a police-room, and other apartments connected with that establishment; the remainder of the building is appropriated to offices for the despatch of University business, and to lecture-rooms for the professor of experimental philosophy and the readers in mineralogy.

5. Radcliffe's Library.—The munificent founder of this library was John Radcliffe, M.D., who was born at Wkęfield in 1656. By his will, 13th September, 1714, he appropriated 40,000l. for the building and purchase of the ground on which it stands; 100l. per annum for the purchase of books, and 150l. per annum for the librarian. James Gibbs, a native of Aberdeen, was the architect. The foundation-stone was laid June 16, 1737, and the building was completed during the reign of George II. It was opened to the public by the ceremonies of the trustees of Dr. Radcliffe's will. It has been appropriated by a late resolution of the trustees to the reception of books in medicine and natural history. In the area of this library a few antique marbles are deposited, with a collection of casts from the best statues of antiquity. Here also is preserved the Coss collection of specimens of the marbles employed in the ornamental architecture of both ancient and modern Rome.

6. The Radcliffe Observatory.—This building was erected out of the funds of the Radcliffe trust, and by the terms of the will. It comprises a dwelling-house for the observer, apartments for observation and lectures, as well as rooms for an assistant-observer, and it is amply supplied with astronomical instruments. The foundation-stone was laid June 27, 1772. The original plan of the building by Mr. H. Keate was altered and completed by Mr. James Wyatt. The Radcliffe trustees appoint the observer, who nominates his assistant.

7. The University Press.—As the great increase of beau...
ness rendered it necessary to have more extensive premises, the delegates of the press were empowered by convocation, in 1825, to contract for the purchase of ground north of Worcester College, for the erection of a new building. The present building was commenced in 1826, from a design made by Mr. Daniel Robertson. The entire front and the south wing were finished in 1827; the north, which was commenced in 1829 under the superintendence of Mr. Blore, was completed the following year; and the south-west side of the quadrangle are houses for the superintendents, an engine-house, strong-room for standing type, &c.

Beside these buildings, there is a Botanic Garden, containing about five acres, originally the burial ground of the Jocelyn family. Its entrance gate, designed by George Jones and executed by Nicholas Stone, is decorated with a bust of the founder, Henry Danvers, earl of Danby, by whom these premises were purchased and improved at an expense of 5000 guineas, in 1632.

The professors of the University are, like those of Cambridge, paid from various sources; some from the University chest, others by the king, or from estates left for that purpose. They are—the regius professors of divinity, civil law, medicine, Hebrew, and Greek, upon the foundation of King Henry VIII., and a fund founded by the bequest of Sir John Margetson; five professors of the Savilian professors of geometry and astronomy; Dr. White's professor of moral philosophy; the Camden professor of antient history; Tomlin's professor in anatomy; a professor of music; two professors of Arabic, one of whom is a professor of the Koran; a professor of divinity; a professor of poetry; a regius professor of modern history and modern languages, founded by King George II., in 1724; an Anglo-Saxon professor; the Vinetian professor of ecclesiastical professor of oriental languages; two chair professors of anatomy, of the practice of medicine, and of chemistry; a professor of political economy; a professor of Sanscrit: Lee's lecturer in anatomy; and readers established by grant from the crown, in experimental philosophy, in mineralogy, and in geology. The annual stipends of these professors give no leeway, a circumstance which is explained by the fact of some of the antient studies of the University having fallen into disuse, civil law for instance; but more particularly in consequence of the practical change which in the course of time has taken place in the system of teaching. The instruction is now given to the undergraduates by their tutors in the respective colleges, and the University merely determines the course of instruction and superintends and directs the examinations which it requires the students to submit to as a qualification for the attainment of the degrees which it confers on them.

The total number of members upon the books of the different colleges and halls of Oxford, at the end of 1839, was 5440.

Oxford is the metropolis of the country, and the metropolitan city of the empire. It is the center of the world's commerce, the focus of its manufactures, the seat of its arts, the repository of its science, the resort of its pleasure, the center of its education. It is the nucleus of its political, its religious, its social, its industrial life. It is the meeting-place of the classes, the forum of the public mind, the theater of the national interest. It is the capital of the kingdom, and the capital of the empire.

OXFORDSHIRE. EARL OF. [Harley.]

OXFORDSHIRE, a midland county of England, bounded on the north-east by Northamptonshire, on the east by Buckinghamshire; on the south-east, south, and south-west by Berkshire; on the west by Gloucestershire, and on the north-west by Warwickshire. Its figure is very irregular: the greatest distance is from north to south by east, from the three shrines–stones at the junction of the three counties of Northampton, Warwick, and Oxford, to the junction of the three counties of Berkshire, Oxford, and Wiltshire, is 51 miles; its breadth is very variable: in the northern part, from the neighborhood of Burford to the banks of the Thames, near Oxford, is 32 miles; but to the north of Oxford, the city, the breadth contracts suddenly to about 7 miles; and in the south of the county, the breadth of the county and the breadth of the city are about equal, being 10 miles or more. The county has a well-defined boundary, and has that breadth only for a short space, between Abingdon and Thame. The area is estimated at 756 square miles; it is in size the thirty-first of the English counties, being rather smaller than the present Lincs and Rutland, and larger than Berkshire. The population, in 1821, was 126,571; in 1831 it was 122,162, showing an increase in ten years of 15,185, or more than 11 per cent, and giving 201 inhabitants to a square mile: in amount of population it is the thirtieth of English counties; in density of population, the twentieth. Oxford, the county town, is at the junction of the Charwell with the Isis; 51 miles from London (St. Paul's) in a straight line north-west–south; 57 miles from the General Post-office, which is close to St. Paul's, by the Ludlow and Worcester mail-road through Uxbridge, Beaconsfield, and High Wycombe; or 60 miles by the Chinnor and Gloucester mail-road, through Hounsdown, Cribanbrooke, Maidenhead, and Henley.

Surface and Geological Character. — The southern part of the county is occupied by the Chiltern Hills, which are of a coastal formation. The eastern part, on the east side of the Thames, is the Hampshire Basin, bounded on the south-west by the Oxford Clay, and on the north by the Chiltern Hills. The east and west banks of the Thames are occupied by alluvial deposits, which are the best adapted to the soil. There are still several beech woods or plantations, though a large part of the surface is now occupied as arable land or as sheep-walks.

From the foot of these hills the lower formations of the cretaceous group crop out. But the Chinnor green-sand and scarlet appears, being almost lost in the chalk marl which overlies and in the gault which underlies it: the gault has been sometimes designated Tetsworth blue marl or Tetsworth clay, from the village of Tetsworth near Thame. On the summit, is Nuffield Common, which has an elevation of 757 feet. Nettlebed Hill, near Nuffield Common, is 15 feet high. The Thames flows through a winding valley or depression traversing this chalk range. The Chilterns were once densely covered with pine and fir, and the mountains had the appearance of a forest, and the mode of the subsequent denudation, by which the trees were destroyed, is seen in the west side of the valley, where they are the trees best adapted to the soil. There are still several beech woods or plantations, though a large part of the surface is now occupied as arable land or as sheep-walks.

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The upper division of the oolitic series, comprehending the Purbeck, Portland, and Kimmeridge beds, crops out from beneath the iron-sand. These oolites rise to their greatest height in this platform, and at a distance of which they are covered by the iron-sand and oolite. These beds are quarried at Garsington, not far from Oxford, on the south-west of Shotover Hill.

The surface occupied by these formations from the chalk marl to the Purbeck series forms a forested tract without any lofty hills: each group of formations occupies a strip of surface of varying breadth, extending from north-east to south-west across that narrow part of the county which lies south of Oxford. The Kimmeridge clay does not appear on the east of this platform. In the immediate neighbourhood of Oxford, to the east of that city, the coral rag, one of the formations of the middle division of oolites, forms an elevated platform between the valleys of the Charwell and the Thame. Berksley, on the north-east side of this platform, and Shotover Hill, which is on the southern side it gradually subsides, the strata dipping in that direction. This formation is not found on the eastern side of the county, but on the western side it extends across the Thames into Berkshire: the Thames flows through what appears to be a breach formed in this range. The blue clay or Oxford clay, which forms the lowest member of the middle oolite group, separating the coral rag from the lower oolites, crops out from beneath the oolitic strata with its natural horizon to a depth of 10 to 13 feet, as at Bloxster, Woodstock, Witney, and Bampton, near towns which the line of junction between this and the subjacent formations may be traced. The tract occupied by the Oxford clay is for the most part low and flat. It forms the northern boundary of the Chiltern Hundreds, except in the extreme north-east of the county, where the London beds of the upper series of oolites rest immediately on the Oxford clay, the intermediate formations not being found.

The res. of the county, except the valley of the Charwell, is occupied by the lower division of the oolites. The upper beds of this division, which are probably chalky beds, are often of a very chalky consistency and color. The lower marl, another formation of this division, has obtained its name from a chalky formation, which is a lower marl, which is a thin bed of chalky marl, which is a limestone, susceptible of a tolerable polish, and occa-
Oxford is used as a coarse marble. It consists of thin slaty beds, seldom having a thickness of two or three feet, and pitted by layers of clay varying in thickness from less than an inch to a foot. The calcareous slate of Stonesfield near Woodstock probably belongs to the same part of the series in the forest marl: it is remarkable for the singular variety of its organic remains, among which are the spoils of birds, land animals, amphibia, sea shells, and vegetables. The county, enters Oxfordshire by a road which, in the Stokenchurch district, is known as the limestone called 'pelleicht' each bed is about two feet thick, and is separated by a bed of loose calcarea-siliceous sandstone called 'racing.' The pelleicht, after being quarried, is exposed to the action of a winter's frost: and the blocks, being too large to be cut economically, are left in the beds and disposed in the first activity, rising above the valley: the forest marl and calcarea-slate crop out from beneath the cornbrash, and form the slope above it; and the great oolite, emerging from the northamptonshire escarpment, is in the midst of it.

The extensive districts however, both in Oxfordshire and in the adjacent county of Northampton, some counties have led to the denudation of the cap of the great oolite in several places, causing it to terminate on the north-west in a low terrace, and in the extreme south of the Oxfordshire and in the extreme south of the county, it is an oolitic sandstone. Numerous insulated masses of the great oolite are scattered throughout the space thus denuded, sometimes forming the caps of hills, and in the regular plane of the strata, at others taking the form of extensive masses in the valleys or those parts of the country which, from the inclination of its hills and the considerable inclines planed, thus appearing as if they had been precipitated, perhaps by waters undermining the subjacent sandy beds, into their present situation. The denuded parts occupied by the ferruginous sands extend over the greater part of the Northamptonshire escarpment, the bed of Oxfordshire, some of which are decomposed by exposure to the atmosphere, while others are much harder, and are quarried for flagstones, troughs, and other coarse purposes. The district occupied by these oolitic sands is on the north shore of the Oxfordshire, where it is crossed by the River Thames, and is about 192 feet above the level of the sea. The first act for making this canal was passed A.D. 1769; the last act relating to it was passed in 1829. This canal forms part of one main line of inland navigation between London and the manufacturing towns of the midland iron district, Birmingham, Wolverhampton, &c.; also between London and Manchester and Liverpool.

An immense quantity of coal is conveyed by it from the Warwickshire and South Staffordshire coal-fields to Oxford and other towns on the Thames.

The principal roads are from London to Oxford, and from thence to Gloucester, Worcester, and Birmingham. The road travelled by the Caermarthen and Gloucester mail enters the county at Henley-upon-Thames, and runs by Newmarket and Dorchestre to Oxford, from thence by Witney and Burford into Gloucestershire. That traversed by the Ludlow and Worcester mail enters the county near Stokenchurgh, and runs by Tetworth and Shottesover to Oxford, and from thence by Woodstock and Woodstock to Oxford, and from thence by Woodstock and Woodstock to the county; but the districts watered by these streams are too small to require further notice.

The Thames, or, as it is sometimes called in the upper part of its course, the Isis, first touches the county a little above Oxford, near the junction of the Windrush; then north-north-east to the border of the county, until it finally quits the latter county a little below Henley. The length of this part of its course may be estimated at about 170 miles, with an average of 12 miles per day. From the junction of the Windrush; then north-north-east to the border of the county, until it finally quits the latter county a little above Oxford. From the junction of the Windrush; then north-north-east to the border of the county, until it finally quits the latter county a little above Oxford. From the junction of the Windrush; then north-north-east to the border of the county, until it finally quits the latter county a little above Oxford.
Agriculture.—The climate of this county is, on the whole, colder than its situation in the central part of the island would lead one to expect. The hilly lands in the northwestern part are exposed and bleak; and the influence of the wind is only partially subdued by the low stone coves which form the natural boundaries of the fields. The poorer chalky soils also on the slopes of the Chiltern Hills are late in bringing crops to maturity. But notwithstanding this circumstance, the county may be reckoned amongst the most prosperous agricultural counties of England; and some of the land is of a quality which can scarcely be surpassed anywhere.

The soil may be divided into four distinct classes:—the rich red loam, the stonelake, the chalky, and the irregular loams; the land of this last group is the least gavelled and gobbled, and cannot be cultivated with any of the foregoing. Arthur Young, in his Report of Oxfordshire, states the proportions of these soils as follows:—

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>Acres</th>
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<tbody>
<tr>
<td>Red land</td>
<td>79,635</td>
</tr>
<tr>
<td>Stonelake</td>
<td>164,472</td>
</tr>
<tr>
<td>Chiltern chalk</td>
<td>64,776</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>166,400</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>474,292</td>
</tr>
</tbody>
</table>

The red land is partly in old greens, in which state it is very valuable, and partly cultivated as arable land. A great portion of this division was formerly disposed in common fields and consequently poorly cultivated. The enclosure and division of these lands have, in many cases, doubled their produce. A finer tract of land than this red loam is scarcely to be found. It is neither heavy nor light, wet nor dry, but easily worked at all times; and the crops, with a very slight attention to the cultivation, amply repay the farmer's labor and outlay. The land lets at a high rent, but the tenant can well afford it, his crops being certain, and almost always very abundant.

The stonelake district, which extends from the borders of Gloucestershire across the country to the north of Oxfordshire, is far inferior in fertility. It is not so well watered, and as it is easily worked, and, having a porous subsoil, is not often injured by rain. The soil is formed of decomposed stone, chiefly chalk and sandstone. The subsoil is generally porous. Very fine mead is frequently found at a small depth under the surface; and where the soil is of a light quality with little cohesion, the application of man is highly advantageous.

The chalk district is in the south-eastern portion of the county. The chalk is generally covered to a certain depth with a layer of infertile soil. Even after the chalk has been highly improved, it is not easily worked, and, having a porous subsoil, is not often injured by rain. The soil is formed of decomposed stone, chiefly chalk and sandstone. The subsoil is generally porous. Very fine mead is frequently found at a small depth under the surface; and where the soil is of a light quality with little cohesion, the application of man is highly advantageous.

The land in this county, as in many others, was formerly ploughed in high broad ridges, which, though the moisture did not readily sink through the subsoil. These ridges, so often described, were made by repeatedly ploughing towards the same line in the middle of the ridge. All the good soil was thus accumulated in the crown, and the deep furrows between the ridges were commonly filled with weeds. The consequence was, that much good soil was buried, and half the surface produced little or nothing. It was not an easy task to correct this and to lay the lands into neat and moderate stitches, so that the crown and furrow might not annually occupy the same line. It took some time to undo what many years had been employed in effecting, and some caution was required not to proceed too rashly in this reform. If the good soil of the crown were buried at once in the deep furrows in order to level the surface, the crops would be very deficient. The only rational plan is to proceed slowly, forming a narrow stitch in the old furrows and gradually widening it and raising it, till the old high stitch is divided into two moderate ones. Where the subsoil is porous or the land has been oppressively underdrained, it may be ploughed flat without risk or danger, and the crop will be better and more equal.

The implements of husbandry now in common use in Oxfordshire are greatly improved. The old plough with a single straight share, only one man and a pair of wheels in front, which, with four horses, scarcely ploughed three-quarters of an acre in a summer's day, is now seldom met with. But more horses are still used than strict economy would warrant, and the time occupied in labour is seldom more than it was when the single ploughman and one person alone were the only implements in use.

The walk of the horses and men is sluggish.

Threshing-machines have been erected on many of the larger farms, but, from the great outcry against them, they are not in general use at this time on moderate-sized farms. The treading of grain is still generally done by men and women, and the machinery employed in husking manual labour to be profitable or not.

Improved implements, such as scythes, grubbers, and drilling-machines, of various constructions, are used in some parts of the county. But the system of ploughing has been improved by some spirited proprietor or efficient farmer. If the land is not always found so useful as the inventors of them would wish the farmers to believe, they excite reflections and comparisons which tend greatly to the improvement of the old mode of cultivation and to the economy of labour.

There are some large estates in the county, the property of noblemen and men of fortune, and a considerable portion of the county belongs to ecclesiastical and other corporations. These last, being set for terms of years or lives renewable at the will of different owners, cannot be cultivated like the red land, and the farmers are not always able to afford a sufficient rent. When the land is let at a high rent, the tenant can well afford it, his crops being certain, and almost always very abundant.

The course of crops on the light loams is based on the Norfolk rotation, but generally with the addition of an extra crop of beans. The largest proportion of land is put into wheat, followed by barley or oats, and the winter crops are mixed in different proportions. Although this gives more crops of corn in the six years, it is very doubtful whether on any but the richest land it is equally profitable, except where there are meadows attached to the farm on which the proper quantity of stock can be kept. In every case, the crop of turnips and other brassica plant is highly improved as where the leases are more certain. Short leases with restrictive clauses are common in some parts of the county, but these are very little more advantageous to either landlord or tenant than when the farm is held at will. It is impossible to give a certain course of crops without destroying every chance of improvement in the system adopted.

The crops of turnips on the light loams are much better than those on the chalk. Although this gives more crops of corn in the six years, it is very doubtful whether on any but the richest land it is equally profitable, except where there are meadows attached to the farm on which the proper quantity of stock can be kept. In every case, the crop of turnips and other brassica plant is highly improved as where the leases are more certain. Short leases with restrictive clauses are common in some parts of the county, but these are very little more advantageous to either landlord or tenant than when the farm is held at will. It is impossible to give a certain course of crops without destroying every chance of improvement in the system adopted.

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into slices or strips by a machine, and given in troughs, which is a great improvement on the old method of folding; and if they are carted off to the cattle yard, the ridges give great facility to the carts, the wheels of which run in the furrows, as well as the horse which draws them. The introduction of the cultivation of mangold-wurzel, which is always in rows, has much diminished the prejudice against turnips in this way.

The corn crops are very generally drilled, and the hand- labor system is almost the rule. The land begins to tiller in spring, is gaining ground, and cannot fail to increase the average produce of this important grain.

On most of the stiff soils wheat is still most commonly sown on a complete fallow, and no doubt the finest crops are produced after the wheat, and this practice, however much commendable, is still a great drawback. The land is cleaner, requires less manure, and is in better condition after the wheat, than if a crop of beans or vetches had preceded. But a whole year is lost every fourth year, and less food is produced for cattle; consequently less manure made. At this the hay crop is somewhat lower than in the other years, and the advantage of greater intervals between the fallow will soon be apparent; but the best farmers find it so. Where the land has been fallowed for wheat, very good crops of barley are produced after the wheat, and this practice, however much commendable, is still a great drawback. Better land is not standing many better. Good wheat land will produce heavier barley than light turnip land; and hence it is asserted by some that barley is better after wheat than after turnips, but no one who has had any experience of this crop will assert this to be the case. The barleys grown on good rich land after a fallow without manuring, but this is too expensive a plan, as the same land would produce a much more valuable crop of wheat.

Barley is more likely to stand across the snow. Women put them in by a line with a short dibble. They are generally put in too close; the rows are seldom above a foot apart, and the beans about three or four inches distant in the rows. This is proved by their often dibbling nearly a sack in a row. They have plenty of soil. Where the beans are dibbled as early as the weather permits; sometimes in January, and generally before March. They are hoed by hand as soon as they have four leaves. By having the rows across the line of ploughing, the ground is more aerated, the hoes have less to do, and the ears growing is given when the beans are a foot high, and the weeds which rise in the rows are pulled out carefully by hand. To have the work done costs from ten to twelve shillings per acre for the two hoeings; it is often done for less, but it is given preferential. It is too much to expect to often depend on the care taken in hoeing the beans whether a crop of wheat may be obtained after them on a single ploughing or not.

Clover and ryegrass are usually sown among the barley, either alone or mixed. The ryegrass alone is admirable food in spring for ewes and lambs. The clover is usually mown for hay, and when the two are mixed, the hay is not only more readily made, but the crop is heavier; the ryegrass shoots above the clover plant and interferes very little with its growth. The hay crop, however, must not be allowed to form its seeds, for in that case it impoverishes the soil, and the wheat crop suffers in consequence.

The cultivation of sainfoin on the chalky loams is one of the great sources of the rich butter and good cheese. Wherever there is chalk, sainfoin will thrive, and continue to yield both hay and pasture for many years. When it wears out at last, and is ploughed up, the soil is found greatly improved for corn. By means of sainfoin many a poor chalky farm becomes profitable. There is one found, not far from the one I write of, which is now the most productive of what it did before. Its value is fully appreciated in Oxfordshire.

The meadows in this county which lie along the banks of the rivers are productive of excellent herbage; and the hay made of such rich milk or grass is much in demand. This may be supposed from the fertile nature of the soil in many places. There are scarcely any irrigated water meadows. The old pastures, which have been in that state from time immemorial, and which many would think it a shame to be put out of use, are the only produce of the land with proper management. But many of the pastures are neglected: rank weeds are allowed to grow in them, and anti-hills occupy a considerable portion of the surface. A little attention would make them much more productive. In some situations above the soil is light and friable, and where the herbage is not of the finest quality, the plough, in spite of prejudice, would greatly improve them even if laid down again in a few years. The dread of not obtaining a good sward again is removed by the improved method of laying down arable land to grass; and the experience of the value of newly-sown pastures, when fed off at first, soon reconciles the farmer to the ploughing of old grass. Many a rich meadow has no doubt been ruined by ploughing it up and taking successive crops of corn, but this is the abuse of many crops. Ryegrass may be let alone, but that which is inferior may be improved by a crop or two of grass in rotations. Within a reasonable distance of Oxford, and between that city and London, the fatting of calves, by allowing them to suck the ewes, is preferred to making butter. The milk is very much less, the value of the milk as well as of the value of the porkers fattened on the skimmed milk, when added to the produce of the butter, will give more than this. A careful dairyman who attends to his business makes the most that can well be got from the cows. Suckling requires less attention, and the milk is of a better quality, and can give a greater value.

The farm-horses in Oxfordshire are mostly good and active; and if too many are often put together to a plough or waggon, they are the fatter and sleeker for it. If the farmer likes to have a couple of fine fat horses, it is his concern; but if he prefer other comforts to the sight of a fine team, he may save a considerable portion of his expenditure, by making his horses do more work, and put out their whole strength. They should not be kept inside, but should go out for the fresh air, and the sun, and the exercise of walking and trying, to work the grain and the manure, and to work the ribs, to do a full day's work. The Oxfordshire waggon has nothing remarkable in them; they are light, and similar to the Berkshire. Single-horse carts, which are in general so much more handy and useful, are only used by a few of the well-to-do farmers. Many farmers, however, are of opinion that a horse and cart can do the work of two or three men, and are by no means disposed to be guided by prejudice, and can appreciate improvements, from whatever quarter they may come. Light single-horse wagons, which have many advantages in some countries, are unknown in most parts of England: on a hard road they are not so useful as the waggon, and in a country where the load they will carry. The mode of feeding the horses in summer by soiling, chiefly with tares and cut clover, is very general, and is to be commended. If the cows were kept in the stable during the heat of the day, the milk would be cooled, and the butter would be produced, and the manure would well repay the trouble of giving them cut food. Some intelligent farmers have adopted this plan, and a very few feed the cows in stalls or sheds all the season.

The cows usually met with in this county are of various breeds, according to the fancy of the proprietors, some preferring the finely proportioned Devonshire cows, some the poor ill-shaped Alderney cows, with their rich yellow cream. Some have cows of the old long-haired breed, but these are not now very common. The improved short-horns are now the favourite breed, both for the dairy and for calves: they fatten off readily, and always obtain fair prices. The small Ayrshire, than which a heavier or more productive breed, and at least of the true breed; but those who have tried them, and reared them on the lands where they were afterwards to be fed, have had reason to be satisfied. They unite the qualities of the Alderneys and short-horns, and may probably breed a breed considered to be most desirable. It is a general observation in all dairies, that the cows bred at home are superior to those of the same breed brought from a distance. Most dairymen buy cows with their young calves, or reared their own, of the favourite cow which is reared now and then. These heifers having been well fed, winter and summer, from their birth, make fine cows, even if the breed be not the best. In the rich vale of the Thames the cow is chiefly of the short-horn breed, and purchased in calf at three years old. In these rich pastures...
tires they will thrive, wherever they may have been bred; 
but if they come from a rich country, and are transplanted 
on to poorer, they will not thrive so well. The short-horn 
beet is too large for a poor soil; the Ayrshire or North 
Devons are better in such situations. The latter are very 
good when they happen to milk well, but they often get fat 
at the expense of milk. The long-horn breed may be (still 
in repute with some, but they are generally superseded by 
the short-horn and the Devon. For fattening calves, 
quantity of milk is of more importance than richness. In 
this respect the Teeswater breed is pre-eminent. 

There are some teams of oxen for the plough, but they 
become fewer every year. In spite of all that has been said 
and written on the subject, and the many calculations of 
the expense of cultivation with oxen compared with horses, 
with the aid of the former, the spirit, of the former farmer, 
takes the first opportunity of getting rid of his ox-team, 
and using horses instead. The sluggish pace of the ox is not 
suited to the taste of a man who strives to introduce eco-

omy of time and active progress in his farm. By using 
for this purpose only the most active horses, walking briskly 
with one plough, while four heavy oxen creep on with another, 
to become impatient of the slowness of the oxen. The oxen 
are fatted off without working; and if this does not give 
so fine-grained beef, it puts more money into the farmer's 
pocket, and is an inestimable advantage.

Sheep are an important object with the Oxfordshire farmer, 
and are in general well managed. The breeds are chiefly 
the Leicester and Southdown, and crosses between these and 
the Lincoln, which produces excellent sheep for such 
situations. The pure breeds seem however to be preferred. 
Where fine mutton and good wool are an object, the South-
downs stand foremost; where quantity of meat and wool 
are to be obtained in a short time, and at the least expense, 
the Leicesters are the most suitable. On short grass the 
South-downs thrive best; in rich meadows the Leicesters. 
The increased cultivation of turnips increases the number of 
sheep kept and fattened. On a moderately light soil with 
a porous subsoil, the farmer will thrive best who can main-
tain that the largest flock of sheep on his arable land. 
The turnips and sheep are the basis of all improved cul-
tivation of such lands. The raising large crops of turnips 
on ridges, and cutting them all for the sheep and lambs, 
will enable a tenant to live and realise a fair profit where, 
without these adjuncts, he would scarcely be able to 

Large horses are prized in Oxfordshire, where enormous 
boars are reared and fattened to be converted into beef. 
But experience proves that a moderate-sized pig, which is 
proportioned at the same time fat and fleshy and at an early age, 
much more profitable. A cotter will have a profit on 
fattening his small hog to ten score, while the farmer will 
lose money with a huge animal which attains twenty or 
twenty-five score when fat. A cross with the small Chinese 
island pigs or the native breed, by lessening the size 
and producing more numerous litters.

The following are the principal fairs in Oxfordshire:—

Brampton, March 26, Aug. 26; Banbury, Thursday after 
Jan. 18, second Thursday before Easter, Holy Thursday, 
Ascension Day, Whit Monday, Aug. 5, Dec. 17; Burford, last Saturday in April, 
July 5; Charlbury, Jan. 1, second Friday in Lent, second 
Friday after May 12, Oct. 12; Chipping Norton, March 7, 
May 6, July 8, Sept. 4, Oct. 5, Nov. 6; Deddington, 
Aug. 31, Nov. 21; Heytesbury, May 7, Holy Thursday, 
Oct. 5, Monday after Sept. 1; Thame, Easter Tuesday, 
Oct. 11; Watlington, April 5, Saturday before Oct. 10; 
Witney, Thursday in Easter week, Aug. 24, Thursday before 
Oct. 16, Thursday after Dec. 1; Woodstock, Tuesday after 
Candlemas—April 5, Dec. 17.

**Directions, Thame, &c.**—Oxford is divided into fourteen 
hundreds, as follows:—

*Hundred, Situation, Acres, Population.*

<table>
<thead>
<tr>
<th>Hundred</th>
<th>Situation</th>
<th>Acres</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bampton</td>
<td>W.</td>
<td>42,070</td>
<td>14,710</td>
</tr>
<tr>
<td>Banbury</td>
<td>N.</td>
<td>21,230</td>
<td>11,449</td>
</tr>
<tr>
<td>Binfeld</td>
<td>S. E.</td>
<td>234,000</td>
<td>8,607</td>
</tr>
<tr>
<td>Bloxham</td>
<td>N.</td>
<td>27,710</td>
<td>8,700</td>
</tr>
<tr>
<td>Bullington Central &amp; E.</td>
<td>46,630</td>
<td>12,097</td>
<td></td>
</tr>
<tr>
<td>Chipping Norton N. W.</td>
<td>69,980</td>
<td>14,975</td>
<td></td>
</tr>
<tr>
<td>Dorchester Central</td>
<td>1,210</td>
<td>8,257</td>
<td></td>
</tr>
<tr>
<td>Ewelme</td>
<td>S.</td>
<td>25,100</td>
<td>6,225</td>
</tr>
<tr>
<td>Langtree</td>
<td>S.</td>
<td>21,560</td>
<td>6,072</td>
</tr>
<tr>
<td>Lewknor</td>
<td>S.</td>
<td>19,560</td>
<td>6,072</td>
</tr>
<tr>
<td>Perton</td>
<td>S. E.</td>
<td>14,190</td>
<td>3,319</td>
</tr>
<tr>
<td>Ploughley N. E.</td>
<td>59,580</td>
<td>14,050</td>
<td></td>
</tr>
<tr>
<td>Thame</td>
<td>E.</td>
<td>10,500</td>
<td>4,735</td>
</tr>
<tr>
<td>Wootton</td>
<td>Central</td>
<td>67,590</td>
<td>17,907</td>
</tr>
</tbody>
</table>

Oxfordshire contains the city and university of Oxford, 
broth market towns of Banbury and Woodstock, 
and the towns of Bampton, Biestor, Burford, 
Chipping Norton, Henley-upon-Thames, Thame, Watlington, 
and Witney. Of these, Bampton (population, in 1831, 
1605), Banbury (population, in 1831, 3373), Bicester 
(population, in 1831, 2668), and Woodstock (population, 
1831, 1380) are described for the limits much enlarged by 
the Boundary Act), are described in their respective articles.

The others we shall notice here.

Oxford is on the left or north-east bank of the Isis or 
Thames about two miles above the bridge of Cherwell 
which flows on the south side of the town. The Isis is divided at 
and near the town into several channels.

The origin of Oxford is unknown. The name is probably 
derived from there having been a ford or passage for 
oxen across the Thames here by the Saxons, Oxanapop, and 
in Domesday, Oxeneford. Early in the eighth century a monastery was founded here and 
dedicated to the Holy Trinity. Alfred is said to have come at 
this town money which bore the inscription Oesnafondeo. In 
the 13th century the town was burned and 
destroyed. Edmund Ironside died at Oxford in the year 
1016; probably by assassination. Canute, his successor, 
frequently resided at Oxford, and had the great council of 
the nation here several times. Harold Harfud, son and 
successor of Canute, frequently resided at Oxford, and 
the castle was burned and destroyed. At the 

On the invasion of England by William the Conqueror, 
the townsman of Oxford refused to admit the Normans, 
and in the year 1067 the town was stormed by William. 
In consequence of this disaster or of the oppressive meas-
ures taken against the Saxons, after the battle of 
domesday Book, only 243 houses were able to par 
the tax, while 712 houses were 'wasted and decayed, 
that they were not able to pay it; yet the unhappy towns-
men were compelled to pay three times as much as in the 
time of Edward the Confessor. Further attempts at revolt 
at revolt, a castle was built by Robert de Oilli, or 
Olgi, on the site now partly occupied by the county 
gate and the house of correction. The foundation of 
Oxeney Abbey by Robert de Oilli, nephew of the builder of 
the castle, and the erection of a new hall or palace by Henry I., 
contributed to revive the prosperity of the town. In 
the beginning of the reign of Stephen (A.D. 1139), Oxford was 
the scene of a tumult, in which some persons of consequence 
were slain, and in consequence of which two bishops and 
other persons were apprehended. In the subsequent reigns, 
the Empress Maude was besieged in Oxford Castle by Ste-
phen, but escaped in the night with three attendants, and 
the castle surrendered next morning. The ground was 
covered with snow, and the empress, with her attendants, 
whites, Sophy, was noticed, as a captive, by the 
besiegers, and crossed the Thames, which was frozen over, 
on foot. The accommodation between Stephen and Henry II., by which the civil war between those princes 
was terminated, took place at a council held at Oxford. Several 
councils of states or parliaments were held at Oxford in 
the following reigns.

In the reign of Edward III. there were great dissections 
 arising from the theological or other disputes among 
the students, many of whom retired in a body to Stamford in 
Leicestershire. The university and town suffered much at 
the same period from a pestilence, which carried off a fourth 
part of the students.
The doctrines propagated by Wickliffe occasioned, in the reign of Richard II., and Henry IV., and V., much discussion and dissension at Oxford, insomuch that at one period the University was threatened with dissolution. These tumults, together with the civil war of the Roses, further tended to depress the University. The troubles of the Reformation further tended to depress the University. In the martyrdoms of Mary’s reign, those of bishops Ridley and Latimer (October, 1555), and a few months later of that of Archbishop Cranmer (March, 1556), took place at Oxford, in front of Balliol College.

The Schools forming a large part of the town, and extending in many directions, the two chartered towns of Oxford and New Oxford are comparatively small. New Oxford, the modern name, was formed by an Act of Parliament in 1555. The University, on which the prosperity of the town much depended, recovered in a great degree from its previous depression, and in the civil wars of Charles I., after once or twice changing masters, Oxford became the head-quarters of the king, who collected here those members of parliament who adhered to him. The members of the University supported the royal cause with great zeal; but Oxford was at last obliged to surrender, after the battle of Naseby, to the parliamentarians under Fairfax. The University was deprived of its endowments, which were restored after the Restoration, and in the reign of Charles II. two parliaments were held at Oxford, A.D. 1665 and 1681. In the reign of James II. the University firmly resisted the illegal proceedings of that prince, who paid Oxford a visit, and sternly reprimanded it for its non-compliance with his wishes; but however, from motives of fear, he afterwards restored. Subsequent to the Revolution, Oxford was regarded as the seat of Jacobite principles; and in 1715, during the rebellion in Scotland, General Pepper, with a body of dragoons, took possession of the University. It was, however, enabled to defend itself, and obtained the support of the various colleges, and after appeasing some individuals and securing the property of others, retired to Abingdon. A regiment of foot was afterwards quartered at Oxford to oversee the disaffected.

The Divinity School is the point of land nearly insularized. The city and liberty, exclusive of the borough of Woodstock and the extra-parochial district of Blenheim park, which are included in the liberty, comprehended, in 1831, an area of 4,680 acres. On the east it is bounded by the Cherwell or Cherwell, on the south by the main channel of the Isis, and on the west by the smaller channels of that river. It is irregularly laid out, but the principal line of streets are Bridge Street, Fish Street, the Corn Market, and St. Giles’s Street, which form one line running from south to north, from the Abingdon gate to the corn market gate, and (Magdalen) Bridge Street and High Street, which run from the London road on the east into Fish Street and the Corn Market on the west, thus forming a T with the line just described. The other streets are for the most part parallel, mingled with more antient (or Gothic) forms. The town is nearly surrounded by meadows.

The city has much increased of late years; new streets, elegant houses, both in rows and detached, and a number of smaller tenements, have been erected. The streets are paved and cleaned, and are lighted with gas. The police and night watch, which are regulated by the University authorities, and maintained at their expense, are very effective. The public buildings, chiefly connected with the University, are all of Gothic architecture, with the exception of the Great Hall, in which the students sit striking from their magnificence, antiquity, or beauty.

On entering the city on the east side by the London road, over Magdalen Bridge, the buildings of Magdalen College present themselves on the north side of Bridge Street, including Printing-Office, and Library. These four university college buildings are for the most part of the fifteenth century, and present some very curious features. The hall, chapel, cloisters, and entrance tower are antient; the tower is characterised by elegance and simplicity; it is crowned with a splendid spire, and is of Grecian architecture. Near opposite to Queen’s is University College; it presents a front of more than 260 feet to High Street, and has two gateways, each surmounted by a tower; the architecture presents some examples of Italian details, mingled with more antient (or Gothic) forms. On the same side of High Street as Queen’s is All Souls’ College, at the corner of the opening from High Street into Radcliffe Square. It has a gateway, and some other Gothic portions of good perpendicular character, but those antient parts are mingled with others of later and incongruous architecture. Several parts of the interior, separately considered, are worth of admiration. The opening from the High Street, just referred to, presents numerous edifices of striking character. The newest is the Radcliffe Camera, and the buildings of the new extension founded by Hertford College. On the western side is Brasen-Nose College, the buildings of which are chiefly of the earlier part of the sixteenth century, with some modern alterations and additions. The entrance is a fine Grecian composition, with very good details. Between the eastern and western sides of the opening from the High Street are St. Mary’s church, forming the south side of Radcliffe Square, the Radcliffe Library in the centre of the square, and the Heythrop College. Near the Radcliffe Library, which communicates with Broad Street and Holywell Street, which form a line parallel to High Street. St. Mary’s is a fine church, of good perpendicular character, except the steeple, which is of decorated character, and a porch which is of later and incongruous architecture. The church consists of a spacious nave and aisles, and a chancel without aisles. The steeple is plain, and is surmounted by a spire. The total height is 180 feet. The members of the University commonly attend divine service here. The Radcliffe Camera is a large building, forming a regular polygon of sixteen sides, and of 100 feet diameter; from this basement rises a circular story divided into sixteen compartments by pairs of Corinthian columns, and surmounted by a balustrade, the compartments being connected by a Doric order. An upper circular story of much smaller diameter, surmounted by a cupola and lantern, completes the elevation. The interior is splendidly adornned, and the whole building constitutes one of the most striking edifices in the city. The Radcliffe Camera and Library, and the building of the Bodleian Library, form a quadrangle to which the rest of the Bodleian Library adjoins. The architecture of the Schools is chiefly Gothic, the exterior of a debased character, except some small portions, which are of fine composition; the interior of some are decorated ones. The Bodleian or public Library is one of the most valuable in Europe; the picture-gallery contains some interesting portraits. To the north of the Schools is an open square, the north side of which, towards Broad Street, is formed by the Clarendon (formerly the University) Printing-Office, a fine building of two stories, 115 feet long, with a Doric portico. The building was erected in 1711, from the designs of Vanbrugh. Near the Clarendon Printing-Office is the ‘Theatre,’ used for the more public or solemn assembalies of the University, and the Bodleian Museum. The Clarendon Chapel, situated back from the main streets, are Lincoln, Exeter, and Jesus Colleges. The chapel of Exeter College is a neat Gothic erection of perpendicular character. On the north side of the town, not far from the Clarendon chapel, is the University Printing-Office, a Gothic building; the part opposite the Divinity-School has a fine elevation adorned with Corinthian columns. The University press was formerly worked in the Theatre, and many of the books that are issued have a representation of the building as a vignette in the title-page.

The Museum, sometimes distinguished as the Ashmolean Museum, occupies a building adjacent to the Theatre. The collection was originally formed by the Tractarians, celebrated naturalists and herbalists of London, augmented by Ashmole, who presented it to the University [ASHMOL], and further augmented by Dr. Plot and Edward Llwyd, the first keepers of the Museum, by Borlase, the historian of Cornwall, and by Reinhold Foster. The building was erected by Sir Matthew Wadham, the founder of the Wadham College, the architecture of which presents an intermixture of Italian features with the older Gothic style.

In the notice of the above-mentioned buildings we have arranged them according to their locality, proceeding from the London entrance. The following are near the southern or Abingdon entrance, which is by a long bridge, or succession of bridges, over the arms of the Isis or Thames. Christ-Church College is on the eastern side of Fish Street, and consists of the great quadrangle, and another quadrangle called Peckwater, besides smaller portions. The buildings are partly of Gothic architecture and perpendicular date; but chiefly belong to a later period. The hall, built by Cardinal Wolsey, is very fine;
and the entrance tower, containing the great bell, 'Tom of Oxford,' is much admired. Near the college is the cathedral of Christ-Church, which is so enclosed by college buildings and by gardens, that no good view of the whole can be well obtained. It formerly made part of the monastery of St. Frideswide, founded about A.D. 725, for nuns, afterwards occupied by secular canons and afterwards by regular canons of the order of St. Austin. The monastery was suppressed by the Pope at the desire of Wolesy, in order to the establishment of the Cardinal's intended college of Christ-Church, and was subsequently (A.D. 1560), by Henry VIII, given to the Church. The church, which is inferior to most of our cathedrals, is in the form of a cross, and with a tower and spire at the intersection of the nave and transepts. The nave and choir have each two side aisles; the north transept has but one on the west side; the south transepts are on the east side. The dimensions are given by Browne Willis as follows:—length 154 feet (154½ feet Britton's Cathedral Antiquities); breadth of body and side aisles 54 feet (52 feet 10 inches, Britton); length of the transepts is the chapel of the University. The body of the church is longer than the south by one arch; the height of the roof in the western part is 41½ feet; in the eastern part or choir part, on account of the vaulting, 4 feet lower; the height of the steeple is 144 feet (146 feet, Britton). On the north side of the church are two large shrines, one by the High Altar and the Latin Chapel; and on the south side of the building are the cloisters and the chapter-house, and some other apartments. The general character of the building is Norman (or, as it is sometimes called, 'Saxon'), with additions and alterations of various dates. Source: Browne Willis, who described the erection of this church to Ethelred II. (A.D. 1002 or 1004); others, with better reason, fix the erection in the twelfth century. The chapter-house is of later date than the main building, and is a valuable specimen of the early English Archiecture. The main building and Norman tower is of plain early English architecture, and the remains of the cloisters are of perpendicular date. The roof of the choir is curiously and beautifully groined with pendants. The church has many curious and interesting details of architecture; some of the most striking parts are of perpendicular character. The church is not unfrequently overlooked by those who visit Oxford, their attention being drawn rather to the college than to this church. Oxford contains only one school, a small Sunday-school, with 10 children, supported by endowment.

The Education Returns of 1833 give for the city three infant or dame schools, with 150 children of both sexes; fifty-five in infant and one hundred and thirty-five in the schools. There were besides two boarding-schools, and one or two schools connected with Dissenters, of which no return was obtained. Some of the day-schools were also Sunday-schools; and there were nine other Sunday-schools, with 182 boys, 261 girls, and 70 children, whose sex was not stated. Binsey contains only one school, a small Sunday-school, with 10 children, supported by endowment.

Burford is in Bampton hundred, on the southern bank of the Thames, 18 miles from Oxford and 1 1/2 miles from Witney. The area of the parish, including the hamlet of Upton and Signet, is 2,175 acres; the population, in 1831, was 1,520 for the town, above one-sixth agricultural; and 246 for the hamlet, about half agricultural: together 1,692. Burford is a small town, with an elegant market-place, surrounded by an ancient market cross. It is the residence of the right reverend Mr. John Howley, Bishop of Oxford; the town is a market town, with a smal market, and is a place of considerable importance. There are several large chapels, a stone chapel in the town, and a grammar school. OXF}

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much mutilated and altered, and has been of remarkably fine woodwork. There are several ancient monuments, a wooden pulpit, and some other portions of good woodwork, a fine circular font lined with lead, with niches and statues, and a few small portions of very old fragment stained glass. Under part of the church is a crypt, used as a bone-house. There are in the town some dissenting places of worship, a schoolhouse, an upper room in which is used as the town-hall, and several almshouses. There was antiently a small priory or hospital dedicated to St. John with a grant of the revenues of which was valued at the dissolution at £13 6s. 6d.; its site is occupied by a mansion, still called the 'Priory,' interesting from its having been the property of the excellent Lord Falkland and of the Speaker Lenthall. Much of the old church was torn down in the middle of the present manse contains some interesting historical portraits by Holbein, Vandyke, and Cornelius Jansen.

The market is held on Saturday, and there are three yearly fairs. The market was incorporated by charter of Henry I. and is said to have sent a member to parliament for one session, and to have been relieved, on petition, of this (at that time) costly privilege. The corporation has no jurisdiction, and of late years the officers have not been regularly elected. The county magistrates have the petty sessions here. The living consists of a manse, granted by the chapter of Fulbrook, of the clear yearly value of £244l., with a glebe-house, in the gift of the bishop of Oxford. There were, in 1633, an infant-school, with 97 children; a free grammar-school, with 35 boys and 20 girls; a girls' school, with about 30 others; eight other day or boarding and day schools, with 55 boys and 87 girls; and three Sunday-schools, with 422 children. A parochial library is kept in the church vestry-room.

Chadlington is in the hundred of Norton, near the head of the river Evenlode, 19 miles north-west of Oxford by Woodstock. The town is of considerable antiquity, and is a corporate town, but has no historical interest. The area of the parish is 3430 acres, or, including the hamlet of Over-Norton, 3675 acres, 328i. 262 per cent. The population was, for Chadlington, 2625, about one-fifth agricultural, and for Over-Norton, 375, more than half agricultural: together, 2637. The town is situated on the slope of a considerable eminence. The streets are partially paved, but not lighted. The upper part of the town is the best built. The houses are chiefly of stone, and, though not regularly built, are many of them substantial and even ornamental. The church is a venerable Gothic building, with an embattled tower at the west end; it consists of a nave, with side aisles, and one of the furnishings were removed in 1833. The churchyard is surrounded by a low, rude wall and garden, and is separated from the chancel by a wooden screen. There are some remains of the ancient roof-loft. To the north of the church is the entrance to the keep of an old castle. There is a town-hall, with a lock-up-house beneath it, a free school, a house, some dissenting places of worship, and some almshouses.

There is a manufactory of woolen girths and horse-chores, which, in 1833, employed fifty persons. Some of the townsmen are engaged in the Woodstock glove trade, but the majority of the workpeople reside at a distance from the town. The agricultural district is flourishing, and there is scarcely any other market-town in a circuit of 13 or 14 miles round. The market in the town on Wednesday, and there are several yearly fairs or great markets for cattle. The corporation has jurisdiction over the parish, except the hamlet of Over-Norton; but a more restricted boundary has been proposed. The corporate body, under the Municipal Reform Act of 1835, consists of four elected aldermen and twelve councillors. Another market had been proposed, and the borough was not to have a commission of the peace, except on petition and grant. The living is a vicarage, of the clear yearly value of £124l., with a glebe-house. There were in the whole parish, in 1833, a free grammar-school, with 16 boys; a recitation-school, besides the school, with 12 boys; a day or boarding and day schools, with 122 boys, 191 girls, and 20 children whose sex was not distinguished; and three Sunday-schools, with 299 children.

Henley-upon-Thames is in Berks hundred, 22 miles from Oxford. In the parish, in 1820 acres; the population, in 1831, was 3618, not one-tenth agricultural. Henley was antiently called Hanlegang and Hanneburg. Some Roman coins have been found here, but no mention of the town occurs until after the Conquest. In 1643 it was the scene of a skirmish between the troops of Charles I. and those of the parliament. Henley is delightfully situated on a gentle ascent from the west or left bank of the Thames, amid hills covered with extensive beech woods and other plantations. The town consists of four with six streets, well paved and lighted, having a plain stone cross and conduit at their intersection: several of the houses are spacious and handsome. The entrance to the town on the east side is by a handsome stone bridge of five arches over the Thames; the church is in the eastern part of the town: it has a good tower, and several interesting portions both of decorated and perpendicular character. The east window has some good decorated tracery; and some parts of the masonry are of chequered work in fit and chalk. The church consists of three with six aisles, the nave, central tower, and chancel, forming a piazza used as a market-house: the building contains a hall and council-chamber, with some rooms, and a place of temporary confinement in the basement. There are some dissenting places of worship, some almshouses, and a small theatre.

The market is on Thursday, and there are four yearly fairs. Henley is a corporate town. The boundaries of the borough are not co-extensive with those of the parish, but comprehend the greater part of the town. The officers consist of a mayor, twelve aldermen, ten wardens, and eight justices of the peace. The borough is governed by the Borough Act. The living is a rectory, of the clear yearly value of £427l., with a glebe-house, in the patronage of the bishop of Oxford. There were, in 1833, an infant-school, with 163 children; a grammar-school, with 19 boys: a master's house, and two boarding schools, with 72 boys and 72 girls; seven other day-schools, with 69 boys and 101 girls; and 'a few small schools kept by old people.' There is a savings' bank; and in the vestry of the church is the library of Dean Aldrich, rector of Henley, who died in 1757, and bequeathed his library to the town, of whom the mayor is one; and sixteen burgesses, of whom the bridgenmen are two. Quarter-sessions for the borough are held; the Court of Record has fallen into disuse. The borough is governed by the Borough Act.

The living is a rectory, of the clear yearly value of £427l., with a glebe-house, in the patronage of the bishop of Oxford. There were, in 1833, an infant-school, with 163 children; a grammar-school, with 19 boys: a master's house, and two boarding schools, with 72 boys and 72 girls; seven other day-schools, with 69 boys and 101 girls; and 'a few small schools kept by old people.' There is a savings' bank; and in the vestry of the church is the library of Dean Aldrich, rector of Henley, who died in 1757, and bequeathed his library to the town, of whom the mayor is one; and sixteen burgesses, of whom the bridgenmen are two. Quarter-sessions for the borough are held; the Court of Record has fallen into disuse. The borough is governed by the Borough Act.

Thame is in the hundred of Thame, and on the south bank of the river Thame, a feeder of the Thames, 47½ miles from London. The town is on the line of the General Post-office, London, through High Wycombe and Stokenchurch. The area of the parish is 5210 acres: the population, in 1831, was 2985, about half agricultural. Thame suffered considerably in the Danish wars. In the civil war of Charles I. and the parliament, several strifes and skirmishes were conducted by the garrisons of the contending parties. Thame consists chiefly of one long and spacious street: the market-place is tolerably commodious. The church is a large and handsome building, cruciform in plan, consisting of nave, chancel, and transept, with a fine embattled tower at the intersection of the nave and transept, supported on four massive pillars. The architecture is early English. The entrance to the church is by a stone porch, adorned by a canopied niche, which once contained a statue of the patron saint; and the church contains several ancient monuments. Near the church are the school-house, a large and noble building, with a fine school-room; and the ruins of the ancient prebendal house of Thame. The school was founded by the will of Lord Williams of Thame (d. 1558), and among the persons educated in it were Bishop Fell, Pococke the Orientalist, Anthony à Wood, and others.

The market is held on Tuesday, and is a considerable market for corn and cattle. There are two yearly fairs, if other fairs are not made in the town. A little lake in the town of Thame is navigable from this place. The living is a vicarage, united with the vicarage of Towsley and the chapelry of Tetsworth and Sydenham, of the joint yearly value of £300l. There were in the parish, in 1833, a free school, with 24 children; 18 boys and 6 girls, and a school, with 17 children, supported by subscription; and three other day or boarding schools, with 86 children; and four Sunday-schools, with 195 boys and 224 girls. The grammar-school had no pupils.

Wallingford is in the hundred of Prioton, about 16 miles from Oxford. The parish has an area of 3440 acres; the population in 1831 was 1833, nearly half agricultural. The town consists of narrow streets, irregularly laid out; the houses are mean and ill built, chiefly of brick. The market-
house is a substantial brick building. The church, an antient building on the north-west side of the town, contains some neat monuments. There are several Dissenting meeting-places, and chapels, or schools, for which there is a school, attended by 30 or 40 girls: there are some corn-mills near the town. There is a small market on Saturday, and two yearly fairs. Petty sessions are held here once a fortnight. The living is a vicarage, of the clear yearly value of £725. There were in the parish, in 1833, an endowed day-school, with 20 boys; two boarding-schools, with 19 boys and 20 girls; and three Sunday-schools, with 254 children.

Witney is in the hundred of Bampton, on the banks of the Windrush, a branch of the weston in the town, 11 miles from Oxford. The area of that part of the parish in which the town stands is 440 acres; the population in 1831 was 3190, scarcely any part agricultural; there are besides this, the four hamlets of Crawley, Curbridge, Hailey, and Lov, with a total living of 7080 acres, and a population of 2165, more than half agricultural: giving for the whole parish 7450 acres and 5336 inhabitants. Witney was a place of some consequence at a early period. It sent members to parliament in the time of Edward II., but discontinued its connection with the county, or, in other words, its return was disfranchised. Blankets were early established here, and Dr. Plot says that in his time 3000 persons were engaged in the weaving business, from children of eight years to decrepit old people. In the latter part of the last century, the manufacture declined, but by the invention of 'the Sadler's' process of manufacturing yarn, it was extended; and in 1831 it employed about 200 adult males in the town and 70 in the adjacent hamlets, besides females and children. The town is in a pleasant situation, and consists of two principal streets. The houses are generally of stone, and the public buildings are numerous and handsome. Few towns containing so many inhabitants, especially with a large proportion of them engaged in manufacture, retain so quiet and rural an appearance. There are the High Street, a staple of blankets; a market-place, built A.D. 1721; a market-hall, built of stone, with a piazza underneath for a market-house; and a market-cross, built A.D. 1683, and repaired A.D. 1811. The house for the free-school, comprising a spacious school-room, a room annexed for the library, and the master's apartments, is a respectable building. The church is a large and handsome cross church, with a tower and a lofty spire at the intersection; the nave has aisles and a clerestory; the transepts are large, and the chancel small. The tower and chancel are in the early English, and the north transept is decorated with a fine window of seven lights; the clerestory and some other parts are perpendicular.' (Rickman.) There are several dissenting meeting-houses. The manufacture of rough cottons, of taffs for bargets, of felt for paper-makers, and of all kinds of wool, is extensively carried on, and there is considerable trade. The Witney blankets are of superior texture and good colour. The market is on Tuesday, and there are several yearly fairs.

The church is a rectory, of the clear yearly value of £200L, in the gift of the bishop of Winchester. There were in the town of Witney, in 1833, one dame-school, with 15 children; the free grammar-school, with 16 boys; an endowed charity school, with 15 boys and 25 girls; two national schools, with 104 boys and 153 girls; and 2 day-schools, with 47 boys and 97 girls; and two Sunday-schools, with 306 boys and 329 girls. The national schools were attended by 70 boys and 50 girls on Sundays.

Oxfordshire, and the county contains several large villages. Ensham, or Eynsham, is on a hill on the northern bank of the Thames, in Wootton Hundred, about five miles from Oxford on the road to Witney. The area of the parish is 5650 acres; the population in 1831 was 1798. The church is a large and handsome building, in a pictuesque situation; it has two bridges, one of which is over the Thames. The parish church is a large Gothic building, with a substantially built western tower: and near the church is an ancient cross, with a taper shaft of elegant proportions. Ensham had formerly a Benedictine Abbey, the yearly revenue of which, at the dissolution, was 441L 12s. 2d. gross, or 421L 16s. 11d. clear. There are some scanty remains of the building. The living is a vicarage, of the clear yearly value of £175, with a glebe-house. There were in 1832 an endowed school, with 14 boys and 4 girls; three other day or boarding schools, with 40 boys and 63 girls; and two Sunday-schools, with 90 children.

Deddington is in Wootton Hundred, 17 miles from Oxford. The area of the parish is 3400 acres, or, including the hamlets of Clifton and Hempston, 3950 acres; the population in 1831 was 1590, or with the hamlets 2078. There was antiently a castle here, but only the earthworks and perhaps some traces of the foundations remain. It was at Deddington that the Earl of Warwick seized the relics of St. John of Gaveston. It was at this time a market and corporate town, and sent members to parliament. It was relieved from the burden of sending members, on petition, in the following reign. The corporation has fallen into decay, and the annual value of late years is £390. The living is a rectory, and contains some portions worthy of examination. The living was in the possession of a family, till 1469, when it was granted to the Chichester family, and purchased in 1750 by the late Col. Fordham. The next owner, Sir James Secrey, Bart., a patron, and a gentleman of great ability, has left the living to his brother, Colonel William Secrey, who is at present the rector.

Hook-Norton is in Chaddington Hundred, near Chipping-Norton. The area of the parish is 3730 acres; the population in 1831 was 1306, two-thirds agricultural. There was a battle fought here between the Saxons and Danes in the year 914, in which the Saxons were defeated. It is thought to be a memorial of this engagement. The living is a perpetual curacy, of the clear yearly value of £100. There were in the parish, in 1833, three dame-schools, with 22 boys and 23 girls; a national school, with 30 girls; four other day-schools, with 37 boys and 17 girls; and two Sunday-schools, with about 200 children.

Charlbury is in a detached portion of Banbury Hundred, between Chipping-Norton and Witney. The area of the parish is 680 acres; the value, tithes, and glebe, £51; the population in 1831 was 193, with 77 girls; and 253 children were taught in the schools of the parish. The living is a rectory, of £150 p.a., with a vicarage, of £100 p.a., and a glebe, of 10 acres. The living is a rectory, of the clear yearly value of £185, with a glebe-house, in the gift of St. John's College, Oxford. There were in 1833, in the whole parish, four dame-schools, with 28 children. A Land-tax of £17 was paid in the parish. The clergyman is assisted by a curate, a schoolmaster, and a schoolmistress. There is an annual benevolence, and a valuable endowment for a grammar-school, but the school is not kept up. There is a lending library at Charlbury.

Headington is in Buntingdon Hundred, about 1½ miles north-east of Oxford. The parish has an area of 1756 acres, and a population of 183, in 1831, with 127 children. The living was for many years held by the see of Oxford, and is now an agricultural benefice. Headington is supposed to have been a royal residence under the Saxon dynasty. The village is pleasantly situated on a hill, which commands a fine view of Oxford; and contains some neat and commodious buildings. The church is an ancient one but the tower is rebuilt; there is a lofty shaft of a cross in the church-yard. A short distance from the village is a stone quarry from which much of the stone has been taken for the various buildings at Oxford; it is however only suited to the more substantial parts, being too porous and too porous to allow for ornamentical work. The living is a rectory, of the clear yearly value of £115. There were in 1833, an endowed school, with 29 boys and 10 girls; five other day-schools, with 36 boys and 36 girls; and two Sunday-schools, with 39 boys and 31 girls.

Caversham is in Binfield Hundred, on the north bank of the Thames, about one mile from Reading in Berkshire. Here was formerly a cell of regular canons of St. Austin. It belonged to Nuercle of Hatfield, and is now in the county of Buckinghamshire, to which abbey the church also belongs. The church is small, and some parts are of great antiquity. Caversham was the scene of a short skirmish during the siege of Reading by the Parliamentarians in the civil war of Charles I. The area of the parish is 3100 acres; the
population in 1831 was 1369, about half agricultural. The
living is a perpetual curacy, of the clear yearly value of 116l.,
with a glebe-house. There were in 1833, a national school,
with 25 boys and 55 girls; and three other day or boarding
schools, with 51 girls and 15 boys; and two Sunday-schools,
with 100 children.

Bloxham, in Bloxham hundred, near Banbury, has an
area of 2940 acres, or, including the chapelry of Milcombe,
4440 acres; the population of Bloxham in 1831 was 1343,
of Milcombe 236; together 1579. The village of Bloxham
and a new building. The church is a handsome build-
ing, with a lofty and elegant tower and spire; the west
door has some curious carving in stone, representing the
Day of Judgment. The living is a vicarage united with the
chapelry of Milcombe, of the clear yearly value of 265l.

There were in the whole parish, in 1833, three
dame-schools, with 46 children; an endowed free-
school, with 50 boys; four other boarding or day schools,
with 18 boys, 28 girls, and 20 children of sex not distin-
guished; and six Sunday-schools, with 93 boys, 79 girls,
and 20 children of sex not distinguished.

Stokenchurch is in Lewknor hundred, on the road from
London by High Wycombe to Oxford. 18 miles from Oxford.
The area of the parish is 4000 acres; the population in 1831
was 1426. There are three schools, the last of which the
parishioner and presents some peculiar features. Several Ro-
man urns were dug up about a century ago. About 70
men in this parish and the adjacent parish of Chinnor
(areas 1760 acres, or, with the liberty of Henton, 2760 acres;
population 1285, of whom 500 are in the town) the living of
Stokenchurch is a chapelry united with the vicar-
age of Aston Rowant, of the joint yearly value of 176l.,
with a glebe-house. There were in 1833, one dame-school,
with 36 children; two boarding or day schools, with 49 children;
six other day schools, with 60 children; and three Sun-
day-schools, with 231 children.

Benington, in speaking usually shortened into Benson,
is in the hundred of Ewelme, on the road from London,
by Henley-on-Thames, to Oxford. It is on the left or east
bank of the Thames. The building is innovation and the plan
was a plain of importance in early times. It was taken
from the Britons by the West Saxons under Cuthwin,
brother of Ceawlin, king of Wessex, A.D. 572. The West
Saxons built a castle here for the defence of their frontier;
this castle was reduced by the Mercians under Offa, who
conquered Cynwulf of Wessex here, A.D. 775. The village
has some good houses: the church is ancient, it has an east
window of decorated character; the tower is modern. The
living is a perpetual curacy, of the clear yearly value of
13l. the income of 1833 was 13l.; there were 3 dame-
schools, with 38 children; two boarding or day schools,
with 49 children; six other day schools, with 60 children;
and three Sunday-schools, with 231 children.

Dorchester, at the junction of the Thames and the Isis
or Thames, is in the hundred of Dorchester; the area of the
parish is 900 acres; the population in 1831 was 866, chiefly
agricultural. The termination 'chester' indicates that it
was a Roman station; and it appears to have been the
headquarters of Richard of Cornwall. The foundations of an
antient town-wall (whether Roman or not our authorities
do not state) are frequently dug up; an extensive embank-
ment called Dykehills, near the village, has given scope for
much conjecture; and Dorchester and its immediate neigh-
bourhood is inhabited by prisoners, with portions of the
other relics of antiquity. The town appears to have been
in the height of its prosperity in the seventh century, when
it was made the seat of a bishopric, which comprehended the
two kingdoms of Mercia and Wessex. This bishopric was
subjoined to all the other bishoprics in the kingdom, but was
still the largest in England, when the seat of it was
removed to Lincoln, A.D. 1086. The place had however
previously declined, owing to the ravages of the Danes.

There was a castle built here, in the middle ages, of which
nothing is now preserved. The town had a weekly market
Canons was founded here, which had at the dissolution a
yearly revenue of 219l. 12s. Od. Some parts of the building
yet remain near the church. The church of Dorchester
is a large and curious church, with portions of different dates
mixed together, and the plan is very irregular. There are portions in all the varying
styles of Gothic architecture, and other portions in which
there is a transition from one style to another. The door at
the western end of the north aisle is Norman, but the
greater part of the church is of later date. There are some
good antient monuments, and a very antient font. The
fragment of the antient abbey has been converted into a
cottage. There is a modern bridge over the Thames at
Dorchester, but the ancient one is still standing. Dor-
chester is a perpetual curacy, in the jurisdiction of the pecu-
liar court of Dorchester, of the clear yearly value of 100l.

There were in the parish, in 1833, an endowed school,
with 40 boys and 10 girls; two other day-schools, with 10 boys
and 22 girls; and one Sunday-school, with 16 boys and 20 girls.

Divisions for Ecclesiastical and Legal Purposes.—This
county is in the diocese of Oxford, of which, till lately, it
constituted the whole. By virtue of an order of the archdeacon,
the archdeaconry of Berks has been transferred from the see
of Salisbury, pursuant to the recommendation of the Ecclesi-
astical Commissioners; and it is further proposed to add the
archdeaconry of Bucks, now in the diocese of Lincoln. All
these are in the ecclesiastical province of Canterbury.

The diocese of Oxford is of late origin. After the disso-
lution of the monasteries, Henry VIII. proposed to establish
eleven new bishoprics, of which he actually established six,
the embarrasments consequent on his extravagance having
eventually interfered with the attempt. The second of the six
bishoprics thus established, Oxford was one. The seat of it was at first fixed (A.D. 1542) in the
magnificent abbey church of Osney, from which it was shortly
afterward (A.D. 1546) removed to the far inferior structure
of the present diocesan church. The diocese of Oxford is the county of Oxford, and formed one archdeaconry, that of Ox-
ford, with the exception of ten parishes which are in the
peculiar jurisdiction of Dorchester (formerly under Dor-
chester archdeaconry), and a few other parishes, which are pecu-
liar, or otherwise exempt. The archdeaconry is subdivided
into the rural deaneries of Aston, Burcot or Biester, Chipping-Norton, Cuddesden, Deddington, Henley, Witney,
and Woodstock, and the deanery of the city of Oxford. The
number of parishes in the diocese, including those of ex-
cepted jurisdiction, was given by Bishop Bullein (A.D. 1546)
at one hundred and ninety-five; the number of churches at the same
time period was one hundred and ninety-seven, of chapels thirty-
one.
The revenue of the bishopric, on the average of three
years ending 1831, was returned at 3106l. gross, or 2548l.
et; but it was estimated in 1837 at 2897l. The revenue of the
cathedral church is so united with that of
Christ-Church College that it cannot be separately stated;
the gross revenue at the above-mentioned period was
25,894l., the net revenue 12,203l., besides houses for the
dean and canons, and other establishments. It comprehends the bishop, dean, archdeacon, and eight canons, besides chaplains, clerks, choristers, and almsmen. The dean
and canons have no separate revenues. The archdeaconry of Berkshire, now added to the diocese, comprehends the
four rural deaneries of Abingdon, Newbury, Reading, and Wallingford.

The county is in the Oxford circuit. The assizes and
quarter-sessions are held at Oxford, where the county gaol
and house of correction stands. This prison can contain 157
prisoners. By an order in Chancery, 300 prisoners were allowed to
be imprisoned than one sleep in a cell. The number of offenders
committed for trial or bailed in the county, in 1837, was
272, of whom 89 were not prosecuted, or had no true bill
found against them, or were acquitted on their trial; and
183 were convicted of capital offenses, of which the
offenders were charged with simple larceny. Of the
offenders, 101 were entirely ignorant, 139 could read
and write imperfectly, and 22 could read and write well; the
degree of instruction received by the rest could not be as-
certained. The number of prisoners thus committed was
6, according to twelve years of age, and 27 more under sixteen.
There is no county lunatic asylum.

Before the Reform Act, Oxfordshire returned nine
members to parliament. Two for Oxford, two for Oxford
city, two for the University; two for the borough of Woodstock, and one for the
borough of Banbury. By the Reform Act three members were to
be returned by the county, the place of election continuing
a bath with lead pipes in the sides covered with plaster painted red. The Roman bricks appeared fresh and sound. At Wilcot, south of Charlbury, are the vestiges of a Roman work for making bricks, tiles, and stone; also a tumulus with fragments of Roman columns and cement. Wilcox, Stonesfield, and Alchester are all near the line of Akeman Street.

In the conquest of the island by the Saxons, Oxfordshire was the scene of conflict on different occasions. The West Saxons, under Cenwalh, who occupied the territory of the Dobuni, readily submitted to him. In the Roman division of the island, Oxfordshire was included in the province of Flavia Cæsariensis.

The most remarkable monument of this early period, if indeed any may be said to exist, is a collection of the Rollrich or Rowrich stones, about three miles north-west from Chipping-Norton. These stones are near the north-western slope of the long range of hills which skirt the county on that side, along the border of Gloucestershire and Warwickshire. They form a ring of twelve stones, each about one hundred feet diameter, and appear to have been originally sixty in number; there are now however only twenty-four that are more than one foot above the level of the soil, nor do any rise more than five feet above the ground, except one, pronounced by some as the chief point, which is about seven feet high. The thickness of this stone is considerable, but not uniform; the thickness of the others rarely exceeds thirteen or fourteen inches. The whole appear to have been taken from a neighbouring quarry and placed in their present situation in a rude manner, though which may be seen in different places. The exact position to which they appear to have been on the north-east; but there are no marks of any surrounding trench, or any avenue of approach; neither have any indications of burial been discovered. The ring is about two hundred and fifty feet north-east of the circle, opposite the entrance. The whole is called ‘the king-stone,’ nine feet in height; and on the east are the remains of another group, called ‘the Five Knights.’

The conjectures of antiquaries as to the origin of this monument are very contradictory, and some of them sufficiently absurd.

Several ancient British or Roman roads crossed this county. Icknield Street or Way crossed the narrow part of it just under the Chiltern Hills, passing near the town of Wallingford, the rising of the hills at Gesting, between Wallingford and Reading. Akeman Street crossed it in the wider part, passing through the Roman station at Alchester, near Bicester, and then passing near Woodstock, Witney, and Burford. Another road ran northward from Dorchester on the Thames to Abingdon and Oxford; and another through Abingdon to London; and one road from Londinium (London) ran north-westward to Alchester, while another, crossing the Thames north of Henley, ran to Wallingford. None of the town or stations mentioned by Polyeni, or in the 'Antonine Itinerary,' are in the county; but the ancient这里有 the remains of a square camp or station, with a ditch and bank, the sides facing the four cardinal points. It is said (Reynolds, 'Ita Britanniarum') that many parts of the streets can be traced. Some have proposed to fix here the station Isavanæ, which others identify with Burnt Mill, near Daventry [Northamptonshire]; but it seems more likely to have been the Aelia Castra of Richard of Cirencester. Numerous coins and other antiquities have been discovered here; Roman bricks are frequently found in the fields, and foundations are turned up by the plough. The neighbouring town of Bicester and the village of Great Chesterton bear in their names traces of Roman occupation. Dorchester on the Thames was probably the Dorocina of Roman writers, of which little is preserved, but urns, coins, and other antiquities have been found at various places. There are traces of a Roman camp near Chaddleton, in the neighbourhood of Chippen-Norton, and of another near Kiddington, between Cherwell and Chipping-Norton, and at Stonesfield, near Woodstock; the latter was thirty-five feet by twenty, and the tessellae were of seven different colours. Many years after this discovery, the areas of several large apartments with tessellated pavements were found on the same spot, together with a brick hypocaust with funnels and

as before at Oxford; and the pollinings being Oxford, Deddington, Witney, and Nettlebed, between Henley and Woodstock was reduced to one member; so that the total number remained as before. The county was probably divided between the two Celtic tribes, the Catuvellani and the Dobuni, of whom the former held the eastern and the latter the western parts. The Dobuni were in subjection to the Catuvellani, and upon the approach of the Romans under the leadership of Aulus Plautius, readily submitted to him. In the Roman division of the island, Oxfordshire was included in the province of Flavia Cæsariensis.

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OXF

the town or castle of Oxford, and have been noticed above.
In the reign of Richard II., Robert de Vere, earl of Oxford,
was defeated at Radcot Bridge, near Bampton, by the in-
surgent nobles (A.D. 1387). In the War of the Roses, a
great battle was fought near Banbury (A.D. 1469), between
the northern insurgents, under their captain, Robin of
Rutland, and the forces of the late earl of York. The earl
himself, earl of Pembroke, the earl had quarrelled with his
constable, Lord Stafford, by whom he was abandoned. He
was defeated and taken, and next day beheaded by the
rebels. No other event of interest occurred in the county
before the closure of the bridge.

Of this Anglo-Norman period there are several memo-
rials in the ruins of castles and religious edifices, but none
of them of great extent. Of Oxford and Banbury castles
there are scarcely any traces: Dorchester Castle has entirely
disappeared; on the site of Abingdon Castle there are some
remains, now converted into a farm-house; this castle was
probably of the date of Edward II. or III., but the interior has
some ornaments of later date, especially a representation of
the Red and White Roses united. Broughton Castle, near
Banbury, is surrounded by a deep moat, crossed by a
bridge of two arches. An ancient tower forms the en-
trance to the court, and several other parts of the antient
edifice are standing, to which some additions of a later date
have been made. There are castle-like edifices at Sulgrave
Manor, Higham Ferrers, Honnington-Norton; the High
Lodge, near Woodstock; at Astall, or Asthall, near Witney;
in Holton Park (the old mansion), between Stokenchurch
and Oxford; and at Stanton Harcourt, near Banbury, where
there is a kitchen resembling the abbey's kitchen at
Glottonbury.

There are some fragments of Minster Lowel House, near
Witney. The chief part of the mansion was pulled down
nearly a century ago; but the current story of the body of
Lord de Vere, the remains of the supporter of Parkinson, sup-
posed to have been killed in the battle of Stoke by Newarke,
A.D. 1487) [NOTTINGHAMSHIRE] having been found in a
vault, is without solid foundation.

The chief ecclesiastical buildings are the churches of Ox-
ford, of them the most ancient is that of St. Frides Wicewick,
supposed to have been included in the battle of Stoke

way, and a handsome west end. The churches of Han-

borough, Sibonwick, and Great Tew, and Whiteford Chapel
near Burford, have early Norman portions. The more

ancestors of the family of the de Vere's. Of these, and some
historical interest, from its being the scene of the early life
of Rosamond, daughter of Lord Clifford, the "fair Rosamond" of
Henry II., and the place of her interment. The story of her being
poisoned by the jealous Eleanor, Henry's queen, is a popu-
lar fiction. Henry placed Rosamond during the continuance
of their amours in a house, or, as it was antiently termed," a
bower," which he had at Woodstock. It seems however
that their intercourse was broken off on Henry's marriage,
and Rosamond retired to Woodstock, where her husband
forswore her and placed her under the sentence and
seclusion till her death. She was buried at first before the
high altar; but her remains were afterwards removed out of the church into the chapter-house, which is
probably the building at the angle of the enclosure yet
standing. From her being outlawed and the tomb destroyed,
Leland, who mentions this fact, says that her bones were closed in leather, and outside that with lead; and that when these were opened, 'a sweet
smell came out.' Of an ancient hospital at Banbury and
Attenborough there are some slight remains; and the fragments of Thame Abbey, which are considerable, are connected
with the manor erected on the site. Part of the shell of a
small alien priory at Minster Lovel is yet standing.

In the civil war of Charles I. this county was the scene of
several severe contests. Oxford was seized by Sir John

Byron, a royalist, at the beginning of the contest: he how-
ever was driven from it by Lord Say, then lieutenant of the
county, but the king recovered it before the battle of Edge-
hill, A.D. 1642. He also took Banbury and Broughton

 castles, the former with a strong garrison. At Oxford, Charles
assembled those members of the two houses who adhered
to him, and forced them into a parliament of their own,
which met in the great hall of Christ-Church College.
Here the commissioners of the parliament waited on the
king (A.D. 1643) with proposals of peace, but these negotia-
tions were soon broken off. In the same year a severe skir-
nish took place at Caversham Bridge between a body of the
parliamentary army, then besieging Reading, and a body of
the king's troops, under Prince Rupert and General Rut-


hven, who attempted to reliever the town; and about two
months after occurred the skirmish of Chalgrove Field, near

Watlington. Prince Rupert had beaten back the parliament
army near Thame, and was returning to Oxford with many
prisoners, when he was overtaken by the parliamentarians,
whom he repulsed. It was in this skirmish that Hampden
was mortally wounded: he died at Thame three weeks after.
In the summer of 1644, Waller, and the parliamentary armies
of Essex besieged Oxford, but retired from the city on learning
that the king had left it. An undecisive skirmish was fought soon after at
Bury Street, near Banbury, between the king's army and that
of Waller. Banbury was occupied by a body of parliamentari-
ans under Colonel Fiennes, but the siege was raised on the approach of a royalist detachment
under the earl of Northampton. In April, 1645, Cromwell
occupied the town, and the king fled back to Wiltshire.
Oxford and Biester, and obliged Colonel Windebank, who
occupied Bleckington House with a garrison of two hundred
men, to surrender. Oxford was soon after besieged by
Fairfax; but the siege was raised, in consequence of the
king's attack upon Leicester; and the king, after his defeat
at Naseby, found shelter in this city all the winter. In 1646
the parliamentary took Woodstock manor-house and Ban-
bury Castle by capture; and the garrison of Oxford, which
was again besieged by Fairfax, surrendered by order of the
parliamentaries, who had then the upper hand of the
enemies. No political event of interest has occurred since,
except the occupation of the city of Oxford by a regiment
of dragoons in the rebellion of 1715.

(Results of England and Wales; Dunkin's Oxfordshire;
Pittris and Cowe's Ancient History of the Geography of
England and Wales; Priestley's History of Navigable Rivers
and Canals; Rickman's Gothic Architecture; Palgrave's
Progress and Rise of the English Commonwealth; Reynolds's
Jter Britanniarum; Parliamentary Papers.)

STATISTICS.

Population.—Oxfordshire is chiefly an agricultural county,
it being the eleventh in the list of agricultural counties. Of
39,023 male inhabitants twenty years of age and upwards,
18,580 are engaged in agricultural pursuits, whereas
men are employed in manufactures or in making manufacturing
machinery. Of these latter, 200 men were employed, in
1831, at Witney, in making blankets; 60 at Hailey, and
11 at Crawley. In Banbury and its vicinity, 125 men were
employed in ploughing and girt making, 78 at West
Bourton, and 24 at West Chedworth. There were some few weavers at
Bloxham, Adderbury, and elsewhere. Glove-making gives
employment to some of the population in the vicinity of
Woodstock. Many females are occupied in this work; and about
three fourths of the females in the district are engaged in this
employment. At Chipping-Norton, a small number of
men are employed in some few other manufactures.

The population of Oxfordshire, at each of the four follow-
ing periods, was:

<table>
<thead>
<tr>
<th>Year</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Increase per cent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1801</td>
<td>53,786</td>
<td>55,594</td>
<td>109,380</td>
<td>10.62</td>
</tr>
<tr>
<td>1811</td>
<td>59,132</td>
<td>60,059</td>
<td>119,191</td>
<td>8.73</td>
</tr>
<tr>
<td>1821</td>
<td>68,154</td>
<td>71,158</td>
<td>149,312</td>
<td>107.77</td>
</tr>
<tr>
<td>1831</td>
<td>76,387</td>
<td>75,769</td>
<td>152,156</td>
<td>10.77</td>
</tr>
</tbody>
</table>

showing an increase between the first and last periods of
25,236, or about 283 per cent. on the whole population,
being 184 per cent. below the whole rate of increase through-
out England.

The following table exhibits a summary of the population,
&c., of every hundred, as taken in 1831.
County Expenses, Crime, &c.—The sums expended for the relief of the poor, at the four dates of—

<table>
<thead>
<tr>
<th></th>
<th>1801</th>
<th>1811</th>
<th>1821</th>
<th>1831</th>
</tr>
</thead>
<tbody>
<tr>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td>Manual labour</td>
<td>8,975 7 70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team labour and carriage of materials</td>
<td>638 2 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials for surface repairs</td>
<td>2,114 1 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land purchased</td>
<td>32 6 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deductions in obtaining materials</td>
<td>906 1 12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tradesmen's bills</td>
<td>1,006 17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salaries of treasurer, clerk, and surveyor</td>
<td>1,123 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Law charges</td>
<td>1,293 3 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest of debt</td>
<td>5,330 16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improvements</td>
<td>1,575 5 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debts paid off</td>
<td>772 8 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incidental expenses</td>
<td>396 8 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated value of statute duty per-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>formed</td>
<td>151 16 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total expenditure</strong> £24,925 15 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The county expenditure in 1834, exclusive of that for the relief of the poor, was £7734 14, disbursed as follows:—

<table>
<thead>
<tr>
<th></th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridges, building, repairs</td>
<td>933 15 0</td>
</tr>
<tr>
<td>Gaols, houses of correction, &amp;c., and maintaining prisoners,</td>
<td>3,091 0</td>
</tr>
<tr>
<td>Shire-halls and courts of justice, building, repairing, &amp;c.</td>
<td>29 15 0</td>
</tr>
<tr>
<td>Prosecutions</td>
<td>1,804 19</td>
</tr>
<tr>
<td>Clerk of the peace</td>
<td>691 1 0</td>
</tr>
<tr>
<td>Convoyage of prisoners before trial</td>
<td>491 1 0</td>
</tr>
<tr>
<td>Convoyage of transports</td>
<td>129 2 0</td>
</tr>
<tr>
<td>Vagrants, apprehending and conveying</td>
<td>191 2 0</td>
</tr>
<tr>
<td>Constables, high and special</td>
<td>1,066 13 0</td>
</tr>
<tr>
<td>Coroner</td>
<td>177 13 0</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>229 15 0</td>
</tr>
<tr>
<td><strong>Total expenditure</strong> £8,775 0 0</td>
<td></td>
</tr>
</tbody>
</table>

The number of persons charged with criminal offences at the three septennial periods ending with 1820, 1827, and 1834, were 746, 942, and 1425 respectively, making an average of 106 annually in the first period, of 134 in the second period, and of 203 in the third period. The number of persons tried at quarter-sessions in each of the years 1831, 1832, and 1833, in respect to which any costs were paid out of the county rates, were 87, 69, and 65 respectively. Among the persons charged with offences there were committed for—

<table>
<thead>
<tr>
<th></th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Felonies</td>
<td>66 0 0</td>
</tr>
<tr>
<td>Manœuvres</td>
<td>12 10 0</td>
</tr>
</tbody>
</table>
The total number of committals in each of the same years was 185, 101, and 124 respectively.

- The number convicted was 117. 67. 71
- The number acquitted was 14. 22. 24
- Discharged by proclamation was 15. 20. 24

There were 286 persons charged with crimes at the sessions and assizes in Oxfordshire in 1838. Of these 25 were charged with offences against the person, 15 of which were common assaults; 19 were charged with offences against property committed by violence; 222 with offences against property committed without violence; 3 for malicious offences against property; 35 against forgery and uttering counterfeit coin; and 14 for various misdemeanours.

Of the whole number committed, 198 were convicted, 56 were acquitted, 4 were not prosecuted, and no bill was found against 8. Of those convicted, 2 were sentenced to transportation for life, and 47 for various other periods; 3 were sentenced to imprisonment for two years or above one year; 24 for one year or above six months; and 117 for six months or under. 5 were fined. Of the whole number of offenders, 252 were males and 34 females; 56 could neither read nor write; 148 could read and write imperfectly; 22 could read and write well; the degree of instruction of the remaining 18 could not be ascertained.

The number of persons registered in 1837 to vote for county members was 2,593. Of these, 3705 were freeholders, 131,10000, 300 copyholders, and 111,100 occupying tenants: being 1 in 29 of the whole population, and 1 in 7 of the male population twenty years of age and upwards, as taken in 1831.

Oxfordshire contains five savings banks: the number of depositors and amount of deposits on the 20th November, in each of the following years, were as under:

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Depositors</th>
<th>Amount of Deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1836</td>
<td>2,618</td>
<td>5,656</td>
</tr>
<tr>
<td>1837</td>
<td>5,274</td>
<td>14,689</td>
</tr>
</tbody>
</table>

The various sums placed in the savings banks in 1836, 1837, and 1838, were distributed as under:

| Year | Depositors Depositors Depositors Depositors Depositors |
|------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| 1836 | 2,618                           | 5,656                           | 5,656                           | 14,689                          |
| 1837 | 5,274                           | 14,689                          | 14,689                          | 46,949                          |

Education. The following summary is taken from the Parliamentary Returns on Education made in the session of 1835:

- Schools: 90
- Scholars: 60

Number of children at such schools:
- Ages from 2 to 7 years:
  - Males: 355
  - Females: 374
  - Sex not specified: 658

Daily schools: 610

Number of children at such schools:
- Ages from 4 to 14 years:
  - Males: 8,450
  - Females: 7,730
  - Sex not specified: 2,378

Total number of children under daily instruction: 15,949

Sunday-schools: 284

Number of children at such schools:
- Ages from 4 to 15 years:
  - Males: 6,604
  - Females: 7,161
  - Sex not specified: 2,771

Assuming that the population between the ages of 2 and 15 years has increased in the same proportion as the whole of the population since 1851, and that the whole population has increased in the same ratio since 1811 as in the ten years preceding that time, the approximate number of children between the ages of 2 and 15 years thus found residing in Oxfordshire, in 1833, was about 51,738. Twenty-three Sunday-schools are returned from places where no other school exists, and the children enrolled in these, who are instructed therein, are not supposed to attend any other school; at all other places Sunday-school children have opportunity of resorting to other schools also, but in what number, in what proportion duplicate entry is thus produced, must remain uncertain.

Fifty-five schools, containing 3,347 children, which are both daily and Sunday schools, are returned from various places, and duplicate entry is therefore known to have been thus far carried; making allowance for that uncertainty, therefore, we may perhaps fairly estimate that little more than one-half of the children between the ages of 2 and 15 years are under instruction in this county.

Maintenance of Schools.

<table>
<thead>
<tr>
<th>Description of Schools</th>
<th>By endowment</th>
<th>By subscription</th>
<th>By bequests</th>
<th>Subscriptions from schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants Schools</td>
<td>1</td>
<td>65</td>
<td>261</td>
<td>667</td>
</tr>
<tr>
<td>Daily Schools</td>
<td>73</td>
<td>1,960</td>
<td>3,525</td>
<td>7,038</td>
</tr>
<tr>
<td>Sunday Schools</td>
<td>50</td>
<td>24</td>
<td>949</td>
<td>2,416</td>
</tr>
</tbody>
</table>

Total: 148, 8,336, 18,348, 15,739

The schools established by Dissenters, included in the above statement, are:

- Infant schools: 1, containing 78
- Daily schools: 11
- Sunday schools: 57

The schools established since 1818 are:

- Infant and other daily schools: 644, containing 8,500

Thirty-nine boarding-schools are included in the number of daily-schools given above. No school in this county appears to be confined to the children of parents of the Established Church, or of any other religious denomination, such exclusion being disallowed in almost every instance, especially in schools established by Dissenters, with whom are here included Wesleyan Methodists and Roman Catholics.

Lending-libraries of books are attached to 23 schools in this county.

OXPECKERS. [BUPHAGA; ORTHONyx.]

OXUS is the ancient name of the river Amoo or Jihon. This river rises in the mountains which form the northern boundary of India, and flows into the Sea of Aral. According to most of the ancient writers, it flowed directly into the Caspian; and the statement is said to be confirmed by the existence of its former channel. Herodotus speaks of this river under the name of Araxes (i. 201, 202, 205; iv. 11, 40); though it must be remarked that many commentators suppose that the Araxes of Herodotus is the river of the same name that it is either the Volga or the Jaxartes. It appears almost certain however that this Araxes should be looked for to the east of the Caspian, though it would be difficult to determine whether it should be regarded as the same as the Oxus or the Jaxartes. Herodotus appears to have confused it with the Araxes of Armenia, since he says that it rises in the country of the Matiieni (i. 202) and flows towards the east (iv. 40). According to his account there were many islands in it, some as large as Lesbos, and its mouth was filled by forty mouths, which were all lost in marshes, with the exception of one, which flowed into the Caspian (i. 202). Strabo says that the Oxus rose in the Indian mountains and flowed into the Caspian (Strabo, xi. p. 509, 519); which is also the opinion of Mela (iii. 213) and Pliny (iv. 168). It is probable that it rise in a lake called Oxus; but it is improbable that, with his usual carelessness in matters relating to geography, he confounded its source with its termination.

The Oxus is a broad and rapid river, and receives many affluent streams, of which the most important mentioned by the ancients was the Ochus, which, according to most accounts, flowed into the Oxus near its mouth; though, according to some, it flowed into the Caspian by a separate channel. (Strabo, xi. 509, 518). There is however considerable difficulty in the statements of the ancient writers on this subject. Strabo states that it rises in the same mountains as
the Oxus (xi. 509); which must be a mistake, unless, as is probably the case, the Oxus and the Ochus are to be regarded as the same river.

The Oxus has exercised an important influence upon the history and civilization of Asia. It has in almost all ages formed the boundary between the great monarchies of south-western Asia and the Tartary. The conquests of Cyrus were terminated by its banks, and those of the Macedonians were few and unimportant beyond it. The Oxus appears to have formed one of the earliest channels for the conveyance of the produce of discovery; was also made of independent, though later, by Ptolemy, vi, 19, who informs us that Pompy learned, in the war with Mithridates, that Indian goods were carried by the Oxus into the Caspian, and thence through the Caspian to the river Cyrus, from which rivers they were conveyed by a journey of five to six days to Phasis is a continuance.

The breadth of the Oxus immediately to the north of Balkh is 500 yards, and its depth 20 feet (Burnes's Travels into Bokhara, vol. i., p. 249); but south of Balkh, the river is only 650 yards wide, but from 25 to 25 feet deep. (Burnes, vol. ii., p. 5.)

OXYGEN, an elementary body, the properties of which are best known and most remarkable in its elastic or aseif form, in which it is termed Oxygen gas. The most important of these properties is its power of supporting the growth of fire, as shown by Dr. Priestley on the 1st of August, 1774, and of his numerous contributions to chemical science, this is at once the most splendid and the most solid, and has rendered its name imperishable.

Dr. Priestley has stated, with his usual candour, that the discovery was made quite independently, though later, by Scheele, and he has refuted the unjust claim of La-vosier to be also one of the discoverers of this element. To this gas Dr. Priestley gave the name of dephlogisticated air, Scheele called it empyreum air, and Cavendish called it aseif air. The Greek name of oxygen, from the Greek war, αξία, and the root γνωριμία, to generate, because he considered it as the sole cause of acridity; this appellation it still retains, although it is now well known that there are acids which do not contain it and alkalies which do.

Dr. Priestley first procured this gaseous body by heating the binoxide of mercury, then called mercurius precipitatis per se, in an air-jar, over mercury, by means of a lens, and he afterwards obtained it from other substances.

It is a gaseous body of various uses, to which it is intended to be applied. These ways we shall briefly state and explain, and also describe the production of the gas from the binoxide of mercury, first used by Dr. Priestley.

The process of the formation of oxygen is, that it is derived from carbon, oxygen, and water, the latter in various ways. When this substance is subjected to a retort at a temperature above that required for its formation, the affinity between the metal and the oxygen is overcome; the former returns to its metallic state, and the latter to its gaseous form, when added to the residual atmospheric air, its volume is restored.

If it be quite pure, and the operation be accurately performed, 218 grams (1 equivalent) of binoxide of mercury should be separated by the agency of heat into 202 grams, one equivalent of mercury, and 16 grams, two equivalents of oxygen, measuring 46.5 cubic inches.

By this process the oxygen is, though indirectly, obtained from atmospheric air; for there is a natural metallic oxide, the binoxide of manganese, which is found plentifully, and when it is heated, it is converted into the metallic manganese, the quantity of gas obtained being dependent upon the degree of heat employed; in this case however, unlike that of the binoxide of mercury, the metal is not reduced. The equivalent of manganese (35.5) is 44.2, and the equivalent of oxygen is 16; and when 44 grams are heated to moderate redness in a cast iron retort, half an equivalent of oxygen, or 4 grams, measuring 11.93 cubic inches, are expelled, and there remains in the rector an equivalent of sesquioxide of manganese, composed of 28 metal and 12 oxygen = 40. But if the equivalent of binoxide be strongly heated in an iron retort, it is then converted into red oxide, consisting of one equivalent of metal, and one and one-third of oxygen, which two-thirds of an equivalent of manganese, or 15.5, is equivalent to 25.5 cubic inches. Another but less eligible method of obtaining oxygen from the binoxide of manganese, is to heat it with sulphuric acid in a retort; in this case an equivalent of the binoxide = 44, and the equivalent of oxygen is 8, and 25.5 cubic inches, and there remain in the retort protioxide of manganese combined with the sulphuric acid, forming proto sulphate of manganese. It is to be observed that these statements of the quantities of oxygen procurable from a given equivalent of manganese, and the binoxide, are based on the supposition of its being quite pure, which is hardly ever the case; the binoxide of commerce very commonly contains 20 per cent. of impurity.

Red or deoxidized lead also, when heated, either with or without oxygen, yields oxygen gas, but the quantity obtained is small, and the processes are on several accounts inexpedient. When nitrate of potash also is heated to redness and then allowed to cool, it gives out a considerable quantity of oxygen gas, from the decomposition of the nitric acid; but as it comes over mixed with various other substances, and the ratio of the ozonized gas of the nitric acid, this is not a method usually resorted to.

The oxygen gas obtained from binoxide of manganese is sufficiently pure for all the usual purposes of experiment and manufacture, and the quantity is such as to justify the process being carried on. But when the gas is required for chemical analysis or accurate investigations, it is then obtained from the salt formerly called oxymuriate of potash, but now chlorate of potash.

Chlorate of potash is composed of one equivalent of chlorine, 76, and one and one-third of oxygen, 35.5, or 111.5, where 12.4 grams are heated in a retort, they are resolved into an equivalent of chlorine of potassium 76, which remains in the retort, and 6 equivalents of oxygen, 5 from the acid and 1 from the potash = 48, which measure nearly 146 cubic inches, so that there is scarcely any other substance which yields so much oxygen gas or so great purity. Oxygen possesses great power of combination with other elementary bodies, there being scarcely one with which it is not known to combine, either by means of heat or indirect chemical action. The compound to which it gives rise combining, for example, with certain metals, and also indeed with some other bodies, may be classed under the three heads of oxides, acids, and alkaloids. There are many bodies, which, from the nature of their constitution, according to their degree of decomposition, yield various oxides, and by an increased degree, acids; such substances are charcoal, phosphorus, chromium, &c.; but there is no instance of its forming with different proportions of the same element an acid and an alkali.

The property of oxygen gas is, that it is devoid of colour, taste, or smell, and being transparent, it is also invisible. It possesses the mechanical properties of common air; it is capable of being respired; and a given volume of it will support life much longer than an equal bulk of common air. It does not burn; it is well known, possesses the power of evolving oxides, and by an increased degree, acids; such substances are charcoal, phosphorus, chromium, &c.; but there is no instance of its forming with different proportions of the same element an acid and an alkali.

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The most remarkable property of oxygen gas, and that on account of which it has been called Fire-air, is the facility and splendour with which bodies, when previously ignited, burn in it. Substances which do not undergo combustion in the air, will readily do so, and with great brilliancy, in oxygen gas; iron for example burns very readily in it when previously made red-hot. The intense heat of the light emitted by burning phosphorus in oxygen gas is such as to be scarcely tolerable.

In conclusion, we may remark, that until the discoveries have been developed, and completely soldered to the front and to the neck region in the case of the present species; it constitutes a considerable portion of the lower wall of the orbit, and presents at its base a circular aperture, which is filled by a calcareous disk belonging to the auditory apparatus; the two succeeding joints are in general, perfectly free, and support a rather long terminal stem. The anter- tome is, in general, near; the anterior region is separated from the buccal frame, which terminates it posteriorly, is nearly straight and projects much. The tympanic regions, on the contrary, are not extended, and are in general rather clearly divided into two portions, one corresponding with the effenter canal of the respiratory cavity, and the other situated in front of and outside the first; finally, the curved line which indicates the commencement of the nasal passage, is near the lateral claws, terminates towards the base of the third foot. The external jaw-feet never reach beyond the anterior border of the buccal frame; their first joint is large, and serves as a calcule to close the aperture which is seen immediately before the exterior feels. The third joint is large, and the branchial cavity; it supports at its internal extremity a papilla and a stem, of which the two first joints are very large and cover the rest of the buccal apparatus, of which the three last joints are of the same size and almost the same form. The species of operculum varies, but is never triangular. The jaw-feet of the second pair present nothing remarkable; the first joint of the pal of those of the third is always longer than the corneous blade, which represents the exter- nal foot of the other species. The operculum of these species offer nothing particular. In general, the internal plastron is nearly circular, and the space which separates the posterior foot is inconsiderable. The median odopeme of the thorax ordinarily only occupies the last ring: the sela Tur- cica is not much elevated, and the median dorsal arch, which separate the corresponding cells from the external jaw-foot and the thoracic three first pair, are far from extending near to the median line of the body. The first pair of feet are generally of the same size on each side; but their dimen- sions vary; the last are even and almost the same size in some species, and also in others. The succeeding feet are often of enormous length, and are nearly always slender and cylindrical; this disposition is even carried so far in some of the Oxyrhyncha that it has been compared to a long tail. The eyes are placed not more than six, five, or even four; whilst that of the males remains composed of seven separate rings; sometimes the males have only six segments. It is also worthy of note that in the males the space comprised between the posterior feet is en- larged; also that the last pair of legs is reduced, and that the base of this part of the body, they present nothing parti- cular in the female, and in the male those of the first pair are in general slender, styloform, truncated at the end, nearly straight, and rather long; whilst those of the second pair are rudimentary.

Habits, Food, &c.—The Oxyrhyncha are all essentially marine. None are known to live in fresh-water or to frequent the shores of the sea, but all inhabit great depths, and are generally observed when dredging, or large fish. Their long feet would convey an idea of nimbleness, but these crustaceans are in general slow in their motions, and soon die out of water. No swimmers are known among them.

* * *"
OX H. (M. Edwards) M. Milne Edwards divides this family, which embraces a considerable number of genera, into three tribes: the Macruridzans, the Malina or Maiters, and the Parnithyodonts. The reader will find the two first treated of in this work under their respective titles, and the Parnithyodonts will be described under that name.

OXIRHYNCHUS. [EGYPT.] OXYSTOMA. The Oxystomes of M. de Blainville form the fifth family of his Anisopodbranchia. [JAN. 10.] OXSTOMES, the name applied by M. Milne Edwards to the fourth and last family of Brachyuran crustaceans (type, Leucostea, Fabr.), comprising all the crustacea which make no return to the sea, and are consequently unable to respire, and especially in the conformation of the buccal apparatus. The apertures for the passage of the intromissive organs of the males are hollowed out in the basilary joint of the posterior feet, as in the Oxyrhynchus and the Cycloptoptes. The disposition of the male organ is also nearly the same in the last-named group, but sometimes the number of these organs is less considerable, and does not amount to more than six or seven on each side. In most of these crustaceans the branchial cavity does not present at the base of the feet any aperture by which the entrance of air is necessary for the act of respiration, and this liquid only arrives there by a gutter hollowed out on each side of the prelabial space, serving as a passage for the water expelled from the branchial cavity. This canal is very long in nearly all the Oxystomes, and is cavernous, and the base of the prelabial space is the anterior part of the anterior feet. The internal soft parts have not as yet been discovered to present any particular organization.

The Carapace is generally more or less circular, but sometimes it is curved anteriorly only, and much resembles that of some of the Cycloptoptes. The eyes are ordinarly small. The disposition of the anterior varies, but in most cases the region occupied by these appendages is of small extent. The buccal frame is in most of the family entirely triangular. A very narrow subcutaneous channel, which is much prolonged, often to a level with the eyes and close to the front. The external jaw-feet which fill this have also ordinarily the form of an elongated triangle, and do not permit the terminal stemlet to be perceived externally; they advance then as in the extremity of the buccal frame, but never reach it, so that there is always at this point a gaping aperture which serves for the passage of the water necessary for respiration; in other cases the external jaw-feet are much shorter than the buccal frame; the lamellar appendage of the interarcual joint much exceeds it, and their third joint, which is narrow and more or less tapered anteriorly, does not cover the three small terminal joints. The anterior feet are nearly always short, and in the greater part of the family the body is compressed, more or less elevated above in the form of a crest, and disposed as to be capable of exact application against the buccal frame. M. Milne Edwards divides the family into the following tribes: the Leucostceans, the Calippiotes, the Corysitans, and the Dorippitans.

Leucostceans. (M. Edwards.) Carapace, in general, circular, presenting anteriorly a rather strong projection, at the extremity of which is often found an opening to the orbits. Process short, and cavities very small and nearly circular. The internal antennae bend back nearly always transversely or very obliquely under the front; and the external antennae, which are inserted in a narrow but deep notch of the orbital interarcual angle, are nearly rudimentary. The antennae in the external jaw-feet of the same form do not show uncovered the stemlet which supports their third joint; the palp or lateral branch of these organs is large, and their base separated from that of the anterior feet by a prolongation of the peritomy, which is folded into the sternal plastron. The result is that the aperture situated ordinarily at this point, and serving for the entrance of the water into the respiratory canals, was wanting, and that liquid only arrives at the branchiostyle by means of two canals hollowed on each side of the prelabial space and parallel to the adjacent canals of the respiratory cavity. The second pair of jaw-feet present nothing remarkable; but the first pair have the terminal joint of their stem lamellar, and sufficiently long to arrive at the anterior extremity of the buccal frame.

The sternal plastron is nearly circular, and the legs are slender. The number of abdominal joints is three or four. (M. E.)

M. Milne Edwards arranges the following genera under this tribe—Porion, Chlorion, Thia, Polydesmus, Caprocha, Cymopolia, Coryspes, and Oxystoma. Of these genera, Coryspes has already been described and illustrated in this work.

Corysitans.

Carapace sometimes circular, sometimes very much widened, and always more or less convex. Front of moderate width, and the lateral borders of the carapace delicate and more or less dentiluted. External antennae small, but very distinct. External or first pair of feet strong, compressed, curved so as to apply themselves against the buccal region, and armed above with a more or less elevated crest. The apertures by which the water arrives in the respiratory cavities are disposed in the ordinary manner in front of the base of the anterior feet, and the number of branchiostyles is small.

The genera arranged by M. Milne Edwards under this tribe are, Calippa, Platymera, Mursia, Orthysia, Malata, and Heptatus. Calippa and Heptatus have already been illustrated in this work.

Corestians.

Carapace very much depressed, truncated anteriorly, a little widened behind, nearly quadrilateral, and in general too short to cover the whole body. Front wide; eyes of the ordinary size. Disposition of the mouth approximating nearly to that in Calippa, Mursia, &c. The water reaches the branchiostyles by two apertures situated in front of the base of the anterior feet. The sternal plastron is circular and strongly recurved toward the interior part. The anterior feet are short; those of the two succeeding pairs are long and terminated by a styleform joint. The last or the two last pair are inserted above the others, upon the back, to so a small extent that they are nearly always much smaller than the preceding; they are terminated in general by a hooked joint, so disposed as to be capable of acting as a prehensile organ. (M. E.)

M. Milne Edwards arranges the following genera under this tribe: Dorippa, Cymopolia, Caprocha, and Ethusa. Of these, Dorippa and Ethanusa have been already described and illustrated in this work.

Dorippitans.

Carapace very much depressed, truncated anteriorly, a little widened behind, nearly quadrilateral, and in general too short to cover the whole body. Front wide; eyes of the ordinary size. Disposition of the mouth approximating nearly to that in Calippa, Mursia, &c. The water reaches the branchiostyles by two apertures situated in front of the base of the anterior feet. The sternal plastron is circular and strongly recurved toward the interior part. The anterior feet are short; those of the two succeeding pairs are long and terminated by a styleform joint. The last or the two last pair are inserted above the others, upon the back, to so a small extent that they are nearly always much smaller than the preceding; they are terminated in general by a hooked joint, so disposed as to be capable of acting as a prehensile organ. (M. E.)

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OXYSTOMUS, M. Swainson's name for a genus of birds arranged by him among the typical Storlings. [SITRA.]

OXYVURUS, M. Swainson's name for a genus of birds placed by him under the subfamily Certhiidae, with the following.

Generic Character.—Bill short, straight, very slender, resembling that of a Syris or a cormorant; bill margin inflexed; the tips entire. Wings rather lengthened; the outer quills graduated, the fourth and fifth equal. Feet large. Middle toe of the same length as the hinder; lateral toes unequal, the outer connected to the middle as far as the first, the inner to the other two. The inner web broad, and abruptly sinuated at the end; outer web very narrow; tips of the claws hard and naked as in Dendrocop-ter. "

Locality.—South America. (Sw.) Examples, Oxyvarus ornatus and Oxyvarus axiliaris. (Lah., 'Syn.')

OYER AND TERMINER. These words in ancient law French denote a commission forming a court of criminal
judicature, the distinguishing character of which is described by them. The substance of the commission, or as it was antecedently called, is an authority given by the king to certain persons judicially to hear and determine (query at term) certain civil and criminal causes. The commissions of oyer and terminer are the most comprehensive of the several commissions which constitute the authority of the judges of assize on the circuits. On these occasions they are usually directed to the lord chancellor, several barons of the exchequer, the judges, the king's attorney, the king's privy seal, the king's counsel, the sergeant-at-law, and the associates; but (excepting on the Northern Circuit, where all the commissioners but one are of the quorum) the judges, the king's counsel, and the serjeants are always of the quorum, so that the proceedings are in every respect as solemn and formal as those of any of them. Justices of oyer and terminer at the assizes, by the terms of their commissions, jurisdiction to inquire into the truth of all treasons, misprisions of treason, felonies, and misdemeanors committed within the several counties and places which constitute their circuit, and also to hear and determine the same on certain days and at certain places to be appointed by themselves. Besides these ordinary courts of oyer and terminer at the assizes, special commissions of oyer and terminer are sometimes issued upon particular occasions and for particular purposes. If any decay have been committed in particular districts, and where the public peace and security require immediate inquiry and punishment. So also special commissions have been sometimes issued in time of war. But in all cases in which the usual jurisdiction of the ordinary tribunals would occasion a failure of justice. A remarkable instance of this kind occurred when Mr. Drummond, afterwards Lord Ashburton, was recorder of Bristol and sole criminal judge under the charters of the city. A forgery of Mr. Drummond's name to a bill of exchange having been committed in Bristol, he properly refused to try a case in which he was a party interested, and it was therefore necessary to issue a special commission for the purpose of hearing and determining this single offense. Upon special commissions of oyer and terminer the course of the proceedings is nearly the same as upon ordinary or general commissions.

OYSTER-CATCHER. [Ska.-Pirk.] OYSTER-CATCHER, or OSTRACEANS, a family of moncomyarian crustacea. According to Linnæus, the definition of the family is, 'Ligament interior or demi-interior. Shell irregular and foliated, sometimes pappaceous.' Linnæus defined its genus Ostrea as 'Animal Tethys. Shell bivalve, involute, subburdinate. Hinge edentulous, without any sort of internal or external teeth; bivalve, the outer valves of equal thickness, the inner valves of different thickness; and he divided the genus into the following sections:

**Pectines aculurati, squaleatellae.**

Under this section come those Pectens which have nearly equilatorial articulations, as Pectines maximus, Jacobins, Striata, cardinalis, Rhinoclita, Buda, etc.

**Pectines aculurati alterius latissimi Spinoss.**

Under which are arranged Pectines Pallium, nodosum, Pect. felis, pellucens, obliterata, sanguinea, varia, Pustio, globosa, opercularia, gibba.

**Pectines valvolis alterius lato magis gibbis, consisting of P. fasciata, fasciata, Lima.**

**Rudes, vulgo Ostrea dicto, comprising Ostrea Malleus, diluviana, Polium, orbicularia, edulis, seminudiva, Perna, Isognomum, and Ephippium.**

Lamarck's Pectinidae consisted of the genera Pedum, Lima, Pleiostoma, Pecten, Pecten, Spondylus, and Pusio.

The Ostraceans of the same author consist of the genera Gryphaea, Ostrea, Valvula, Placuna, and Anomia. Gryphaea, under his Hiatula (Ostrea, Lima), arranges Ostrea and Pectins (Pectes maximus, Jacobins, Striata, cardinalis, Rhinoclita, Buda, etc.) as follows: 1. Placuna, a genus related to Anomia, and makes the Thorny Oysters, Spondylus, Lima, (with Pectinula, Lammarch) follow. To these succeed Malleus, Valvula, Perna, &c. The Ostracine of M. de Blainville consists of Anomia, Placuna, Harpax, Ostrea, and Gryphaea; and his Substracineae, of the genera Ostrea, Spondylus, Pecten, Lima, and Placuna.
OZA

Paris, 1693, Amst., 1693; 9, 'Récitations mathématiques et physiques', 1 vol., 8vo., Paris, 1694-1720-23-35-77 (the same improved and augmented by Montuel, 8vo., Paris, 1778-90; the same in English by Dr. Hutton, 8vo., Lond., 1-693); 10, 'Traité de la Fortification', 8vo., Paris, 1694-1719 (this was translated by Desguille, 8vo., Oxf., 1711); 11, 'Triomphante', 12mo., Paris, 1698; 12, 'Méthode facile pour arpenter et mesurer toutes sortes de Superficies, &c.', 12mo., Paris, 1699-1725-47-68-79; 13, 'Eléments d'Algèbre', 8vo., Amst., 1702; 14, 'Géographie et Hydrographie', 8vo., Paris, 171; 15, 'La Pratique-Azotique, et pratique', 8vo., Paris, 1711-20. In the "Memoirs of the Academy of Sciences" for 1707 there is a paper by him entitled 'Observations sur un Problème de Trigonométrie sphérique.' To the 'Journal des Savans' he contributed: 1, 'Proof of the Theorem, whether the difference of two powers can be a fourth power,' May, 1688; 2, 'Answer to a Problem proposed by M. Comers,' Nov., 1688; 3, 'Proof of a Theorem relative to Imaginary Roots,' April, 1689; 4, 'Method of determining the last-mentioned, and in which the numerous rivers of Texas have their origin, is so connected with the Ozarks that it may be considered as a portion of them. But this seems to be the only continuous elevated ground which unites the Ozarks with the Chipewyan or Red Indian tribes. This mountain region extends, from south-west to north-east, from the Red River to the Missouri, more than 350 miles in length. If the country about the upper branches of White River, which is covered with high hills, is considered, the Ozarks in the Arkansas and Red River region, which form the west and north-west of the Ozarks, do not consist of parallel ridges. It seems that it is only towards the western edge of the mountain region that a continuous ridge occurs.

At the northern extremity, near the mouth of the Gasconade river, this range is of moderate elevation, hardly exceeding 500 or 600 feet above the sea-level, but its elevation increases farther south. Its highest point is about the sources of the White and Osage rivers, the two most considered by the Osage, which runs along the west and north-west of the Ozarks, to be important. The Ozarks, at the point where the river turns south again, in the district of the Arkansas west of Fort Smith, in some tolerably high hills. The mountains between the Arkansas and Red River form a continuous range, running east and west, and the highest summits, Mount Core, the Sugar-Lock Mountains, and Cavernioli Mountain, attain an elevation of between 2000 and 3000 feet above the sea-level. The last-mentioned range is called the Masterne Mountains.

The country north of the Masserne Mountains and east of the Arkansas River, lying along the western border of the Ozarks, is entirely covered with high hills, which extend eastward to a line drawn from the eastern extremity of the Masserne Mountains, near Little Rock or Arkopolis in Arkansas, to the town of St. Genevieve on the Mississippi (36° N. lat.). This extensive region, which constitutes the eastern broad slope of the Ozark, has an extremely broken surface. The hills and mountains, which are scattered in a long series from the sea-level, and from 500 to 1500 feet above their base. They are exceedingly numerous, and are divided into a multitude of knobs and peaks, which have rounded summits, and descend with perpendicular cliffs and abrupt precipices. The hills are the principal component of these mountains, but their surface is frequently strewed with a profusion of flinty fragments, and in many places it is covered by compact limestone. The hills, which are covered with limestone, contain forests of pine and cedar; much of sandstone in geology, and nearly all the native hickory, haws, and brambles. The poverty of the soil in some instances, and the scarcity of it in others prevents a more luxuriant vegetation from springing up. The valleys between these hills are rather narrow, but have uniformly a depression, and are occasionally subject to excessive floods, which are brought down from the mountains by the rivers, a circumstance which renders their cultivation very precarious.

As this extensive mountain region has been very imperfectly known, we are not acquainted with its mineral wealth. Coal and iron certainly occur in many places. Copper-ore has also been observed. Lead is abundant, especially towards the north-eastern extremity of the region, which contains the rich lead-mines near Foxos in Mississippi. Copper-ore is found in the Ozark Mountains; abundant salt-springs are found on the upper branches of the Washita river. These parts also contain hot-springs. [Arkansas.]

The origin of the word Ozarks seems rather doubtful. It is nothing more than an Indian word. It has been conjectured that it is derived from the French expression, 'Aux Arkansas,' abbreviated into 'Aux Ark,' the pronunciation of which is exactly represented in the English language by Ozarks.

(James's Account of an Expedition to the Rocky Mountains, performed by Major Long; and Nuttall's Arkansas.)

OZEROV, VLADISLAV ALEXANDROVITCH, the most distinguished tragic poet that Russia has hitherto produced. Born in the governor of the Kremlin, Sept. 21 (Oct. 11), 1779. After passing through the usual course of military service, in which, besides otherwise distinguishing himself, he rose to the rank of major-general, he exchanged it for a civil appointment, which he held till 1807, when he was sent to Turkestan on a diplomatic mission. In this post he himself the more closely to his literary studies, he shortly after abandoned them, or at least discontinued writing. 'Polyxena,' which was first performed in May, 1809, being his last dramatic production. From that time to his death, the poet devoted himself to writing the three acts of an unfinished tragedy, entitled 'Medea,' and sketched the plans of two others, one of which had for its subject the siege of Damascus, and is said to have been founded on Hugo's English tragedy of the same name. After a long and a very severe illness, he was carried off at the age of forty-six.

All that can be gathered from what Prince Viazemsky says in his memoir of him, as to the cause of his doing nothing for so many years, is, that he was disgusted with the worthless state of the military service, which his talents had raised up against him, though his productions had been most favourably received by the public.

Although the pieces upon which his fame rests do not exceed rather than four, his first drama, entitled 'The Death of Oling,' bearing no comparison with his succeeding ones, Ozerov may be considered not merely as the reformer, but as in many respects the creator of the Russian tragedy. Kniazhit had improved upon Samurakov, chiefly in regard to style and manner; neither genuine poetry nor masterly delineation of character is to be met with in his tragedies. It was reserved for Ozerov to infuse vitality into the previously cold and lifeless form. His 'Oldiusus,' 'Fingal,' 'Demetrius Donskoi,' and 'Polyxena,' are all true tragedies, and although sample in plan, and with more of dialogue than action, strikingly dramatic in some of the situations.
P.

P is the tenuis or thin letter of the labial series. For the various symbols employed to denote this letter see Alph.

This letter is interchangeable with those which belong to the same organ, that is the lips, and with some others.

Thus

1. P is convertible with b. The Latin, like the Welsh, was fond of the thin letters, in consequence of which there are very few words in that language which begin with a b, while those commencing with p form a numerous class. It will often be found that the p in Latin words becomes a b in the related languages. Thus apicula, the diminutive of apus, a bee, is in French abeille; septem in is German sieben.

The German language b and p more particularly when the former is final. Perhaps, too, even in Latin, the written b was pronounced as a p in the prepositions ab, sub, ob, which correspond to the Greek ato.

2. P with m, somewhat rare. Thus the Greek preposition µή is in the koinic dialect µή. Again, the Greek µήδείµ is essentially the same word with the Latin plumbus.

Allied to this change is the insertion of a p between exist, in the country of Kas (the pumpes, simplus, for sumus, simus, and temptus for tentare).

3. P with w. This change is more particularly to be observed in the derivation of French from Latin. Thus from cappellus, a cap, episcopus, a bishop, ders, decide, dece, in German dânz, apsz, and from pepper, piper, Aprilis, the French have deduced their chere, evce, deccer, &c., owirr, owre, livre, poure, &c.

4. P with f. Two or three examples are given under F. To this class may be added pell; pater, father; praca, fish; pauoi, seue; lupus, wolf. So the Greek πορρου &c, have the aspirate, while the Latin, as usual, prefers the tenuis in pumpra, pempus, deumus.

5. P with y. The latter form is often preferred by the German, where our own tongue has the single letter. Thus the English words sound, peach, pepper, pea-cock, penny, apple, are written by the Germans χαυν, χειφε, χελ, χουν, χελ, χελ.

6. P with η, ο, or ρ. See C.

7. P with τ, as ταυ, in Latin paro. The Greek interro- gative words beginning with τ, as ταυ, τι, ταυτος, &c., are related on the one hand to the Ionic forms χεω, χε, χερος, and on the other to the demonstratives that commonly take a τ at the beginning. And in fact the latter are only a survival of the former.

8. P with pt. The latter is common in Greek, as in τυττα, ταυτος &c, which form their other tenses for the most part without a τ. So too at the beginning of words. Thus κυρις and κυρος consist with κυρος and κυρεος, and it seems probable that it was often a careful attempt to pronounce the initial τ which led to the formation of the Latin words populus, a state, and popolare, to devastate with war.

9. P with ep. This change it will be more convenient to consider under the letter S.

10. P before a vowel with ch. Thus sapiam, in Latin, becomes sache in French. The word roche, too, was probably formed from a barbarous Latin word rupia; and Rupia, in the county of Kent, appears upon this letter. To have changed its name to Richborough.

PAAMUTO ISLANDS. This is the native name of a great number of islands, or rather clusters of islands, scattered in the Pacific Ocean between 13° and 22° S. lat. and 125° and 154° W. longitude. On our charts they bear the name of the Dangerous Archipelago.

These islands are very numerous, and it is supposed that all of them have not been seen by Europeans. They constitute, according to Capt. Fitzroy, between seventy and eighty groups. Each group surrounds a lagoon, and is based on the coral reefs which enclose the lagoon. The islands are very little above the level of the sea. Their form is generally that of a crescent, the convex side being turned to the trade-winds. The highest part of the islands is in most cases on the most eastern part of the curvature, but it rarely exceeds six feet above high-water mark. The coral reefs which surround the lagoon have usually one opening or more, by which the enclosed sea may be entered. By far the largest number of these groups have at least one opening in each cluster accessible to shipping, and a considerable trade has been carried on with the natives for pearl oyster-shells. Fish and shell-fish, hogs, and coconuts are the principal sources of subsistence to the natives. The natives are of different races, and the while the Otahitians in person and language, though the languages differ so much that the Otahitians and they do not easily understand one another. The question has often been asked, how the Malays could have spread to these remote lands against the direction of the trade-wind. Capt. Fitzroy solves this problem by stating that during the settled weather and a steady trade-wind (south-easterly) the surface waters in general move westward from five to twenty miles a day; but that in the rainy season from October to March, when westerly winds prevail, and rain are frequent, the currents vary considerably, and occasionally set eastward, at the rate of from half a mile to two miles an hour. Thus it happens that canoes are drifted out of their course even several hundred miles by currents and westerly winds.

The natives of the several islands, who are not also from the latter, are given laws from the sovereign of Otahiti; they have however no resident authority among them except the head of each family. The navigation between these islands is very dangerous, as many coral reefs, which are met with dry or only just covered with water, are dispersed among them, and the sea surrounding the lagoon has no soundings.

(Fitzroy, in the Narrative of the Surveying Voyages of the Adventure and Beagle; Beechey, Voyage to the Pacific and Beringian Seas; Krusenstern's Memoirs, &c.)

PACA. [CELEGNUMS]

PAC (Passus), a measure of the Roman system, being in fact their unit of itinerary measure, to which the mille passus, or Mile, was referred. The word passus is connected with the notion of a step. The Romans, being a warlike nation, were curious enough to derive its a passus munitus, from the length between the extended hands, instead of a passus pedibus. There is however reason to believe that the mille passus came into use from the practice of measuring distances in new colonies from the number of steps which the soldier made, of a rough reckoning was kept, but whether by actually counting the paces, or by the time of marching compared with the previously known number of paces in a given time, is not known. [M. & C.], and if the notion with disciplined soldiers either method would give very good practical results. Vitruvius describes a machine to be fastened to the wheel of a chariot (an invention revived in our own day), by which its number of revolutions was registered; but this was probably a late invention.

The pace was not, as persons in general suppose, the step, or the distance from heel to heel when the feet are at their utmost ordinary extension; this, which the French metrologists call pas simple, was the gradus or gressus. The passus, or pas double of the same writers, was two gradus, or the distance from the point where the heel leaves to that on which it is set down. Assuming the Roman foot at 11.2 English inches, the pace, which was five feet, must have been 581 inches or 484 English feet.

Here we might stop, if it were not necessary to explain something relative to what it pleased the writers of the middle ages to call the geographical pace, composed of five geometrical feet. What they meant by this measure is not easily understood, except by way of supposition, which is some of their writings confirm, that they imagined a fixed and universal measure of length to exist in nature, and to have been actually obtained. At the beginning of the sixteenth century the Roman mile, at least the mile of 5000 feet or 1000 paces, was generally said to have known. [M. & C.], and afterwards the measures were more often written about than verified. The
stadium, or eighth part of this mile, had also been introduced into books from the Greek system, and it was the common opinion, derived from Ptolemy, that the degree of latitude was exactly 500 stadia, or 624 miles. This made the pace, or the 12th part of the stadium, stand forward as a perfectly linear measure, being the 6220th part of the day that all believed the degree of latitude to be. But though this may be a probable origin of the geometrical pace, it is certain that writers did not adhere uniformly to it, so that the later metropolitans have formed different notions of its length. We shall give the accounts of some modern writers.

Dr. Bernard makes the geometrical pace (which he also calls the land-surveyor's pace) to be five English feet. Greates supposes that a pace of up to five feet, 69 inches was one in use in England. Olaus Magnus makes the geometrical pace to be the same as the Roman pace. Eusebius does not mention the measure at all. Ptolemaeus (who has a theory about the derivation of measures from parts of the human body) makes the only 41 Roman feet. Rómé de L'Isle, who contends that Ptolemaeus has several times confused the Greek Olympic foot with the Roman foot, makes it 41 Olympic feet, that is, 41 English feet very nearly. An older writer, Samson d'Abbeville, cited by Ptolemaeus, lays down a geometrical pace of 5 French feet, and it seems to make the Roman mile to contain a thousand such paces. The conclusion is, that the geometrical pace was an invention of the old writers, a needless addition to the confusion in which their accounts of ancient measures are so confounded.

There is a pace mentioned in ecclesiastical writers called passus ecclesiasticus, or dexter (see Ducange, at the word Dextri), which Dr. Bernard, without stating any authority, makes of the same length as the English yard.

PACHYCEPHALINA. Mr. Swainson's name for the Great-headed Chatterers, which form, according to his first arrangement in his Classification of Birds, the second sub-family of the family of Chatterers, and are placed between Leiothrichinae (Long-legged Chatterers) and Bombicellinae (Swallow Chatterers), the other two sub-families being the Ampelininae, or True Chatterers, and the Pipirinae, or Manakin Chatterers. Mr. James, in his Synopsis, places Pachycephalina, Pachycephalini, and Bombice-llinae to be aberrant.

In the Synopsis in the same vol. (2), the family Ampelidae are made to consist of the following sub-families:—Leiothrichinae, Pachycephalinae, Pipirinae, Greenlets and Thickheads; Bombicellinae; Ampelininae, Typical Chatterers; and Pipirinae, Manakins, subtypical.

In this last arrangement, Pachycephala is placed under the subfamily Viridininae. The subfamily Leiothrichinae (A literature, Tineder, Hides; Dickhüster of the Germans; Pachydermins of the French), the seventh order of mammiferous quadrupeds according to the system of Cuvier as set forth in his Règne Animal.

The first family of Pachyderms in this arrangement consists of those which have a proboscis and tusks, and which are named Proboscideans.

The Proboscideans, in the opinion of Cuvier, have many resemblances to certain Rodents: for instance, their great incisors, or tusks, their jaws, which are often formed of several lamellæ, the form of many of their bones. The whole of this family have five toes on each foot, completely formed in the skeleton, but so incrusted in the callosous skin which surrounds the foot, that there is no appearance of it, excepting perhaps the nails attached to the border of this species of soles. The canines and incisors, strictly speaking, are wanting; but there are two tusks implanted in the incisive bones, which two tusks project from the mouth, and often grow to an enormous proportion for the alveoli or sockets of these tusks, render the upper jaw so high, and so much shorten the bones of the nose, that the nostrils are found in the skeleton towards the upper part of the face; but, in the living animal, they are prolonged into the well known proboscis or trunk of which the reader will find a description under the article Elephant. The pates of the cranium contain large spaces for rendering the skull light; and the lower jaw has no incisors; as may be seen in the same article. The intestines are voluminous, the stomach simple, and the cecum enormous. The mam-

The other genus is extinct, and consists of the Mastodons. (Mastodon.) The second family, the Ordinary Pachyderms, have either four, three, or two toes.

Those which have the toes equal are in some sort cloven-footed, and, in many respects, approximate the ruminants in the skeleton and in the complication of the stomach. Living genera, Hipposporum (see the article) and Sua (Linn.). [Suidæ] Extinct genus, Anoplothérium.

Those which are not cloven-footed form genera which very much resemble each other in the jaws, in having on each side seven upper molars with square crowns and various projecting lineaments, and seven lower ones with double crests on the crown, the last of all having a triple crescent; but their incisors are different.

Genera. Rhinoceros; Hyraë; Palæotherium; Lophodon; and Tapir. [See the articles.]

The third family consists of the Solidungula, which apparently have four toes on each fore-foot and a single hoof or shoe on each foot, but on each side of the metacarpus and the metatarsus are bony points or processes which represent two lateral toes.

Genus Rhinoceros, Linn. [Hors.]

To these may be added the following extinct genera:—Chalicotherium, allied to the Tapirs; Hipposyrinx, belonging to the Suidæ; Anthracotherium, allied to Choropotamus and the Dichobates (Palæotherium); Elosotherium, placed by Fischer between Rhinoceros and Hyraë; Diceratherium arranged by Meyer between Rhinoceros and Dinosaurium; Callichthrichis, placed by Meyer between Anoplothérium and Palæotherium; and Adapis (Adapis); and Hipposyrinx, an animal allied to the horse. [Hipposyrinx.] Diceratherium, Suidæ, and by Fischer as a new order of Suidæ. Others are nearly allied to the Tapirs, in which case the extinct animal must doubtless find a place among the Pachydermata. [Dinotheriæ; Tapir.]

PACHYMERES. (Byzantine Historians, p. 82.)

PACHYMYRA. [Labide, vol. xiiii., p. 334; Petrellis.]

PACHYRYNCHUS. [Pharimae.]

PACHYSTOMAS, the Rev. Landouz's name for a genus of his Amphuaritacea. The shell is described as having a thick margined lip, frequently channelled, and instead of a spiral, a two-columnar or conical form. Guiding into two sections: 1, consisting of the species which have a small umbilicus and a globoso shell (Amphuaritacea globosa, corrigatur, and punctulata, Sw.); 2, consisting of the species which (Amphuaritacea crassa, Sw.) with an evanescent umbilicus.

PACHYTES. (Dianchora; Spondylus.)

PACHYTHERING. M. Land's name for an extinct genus of mammiferous quadrupeds approaching Hlothoptera, but with greater proportions than that genus. [Megatheriæ, vol. x., p. 73.]

PACIFIC OCEAN. THE, extends between America on the east, and Asia and Australia on the west. It received this name from Magellans, the first European who traversed it, and who, having experienced bad weather and heavy gales in the Strait of Magellans, sailed into the wide expanse of this ocean with a moderate south-east trade wind, and enjoyed fair weather without interruption. He accordingly called it the Pacific. It is also called the South Sea, because vessels sailing from Europe can only enter it
after a long southerly course. The name of South Sea has been limited in later times to the southern portion of the Pacific.

The Pacific is the greatest expanse of water on the globe, of which it covers more than a half of the surface. The area is roughly estimated at more than a hundred million square miles. Behring's Strait, which may be considered as its most northern boundary, lies between East Cape in Asia and Cape Prince of Wales, near 66° N. lat., and is less than a thousand miles wide. The point southerly of the coasts of both continents, which enclose the Pacific, recedes rapidly from one another, and at 54° 30' N. lat., between the western point of the peninsula of Alashka and Cape Krotzkoi Nos on Kamchatka, they are upwards of 1200 miles apart. Cape Cross on the coast of the New Sonden Islands in the north of New Guinea is about 8500 miles from the coast of China east of Canton; and this may be considered as nearly the average width of the Pacific between the tropics. Near the southern tropic, Sand Cape in Australia is about 9200 miles from the northern coast of China. Towards the southern extremity, the Pacific is divided from the Atlantic by a line drawn from Cape Horn to the Antarctic pole, and from the Indian Ocean by another line drawn from South-West Cape in Tasmania (Van Diemen's Land) to the same pole. The trade winds of the Atlantic and the Indian Ocean are sent off branches, which penetrate deeply into the adjacent continents; but extensive peninsulas project from the continents which border on it, and these, together with some adjacent rows of islands stretching far into the sea, separate them from the main body of the ocean. This is less the case on the American than on the Asiatic side. Only two peninsulas project from the American continent. The peninsula of California divides the Pacific from the Bering Sea, and the peninsula of Alashka with the Aleutian Islands divides the Kamchatka Sea, from the Pacific. The peninsula of Kamchatka, which projects from the continent of Asia, divides the Kamchatka Sea from the Sea of Okhotsk, which latter is separated from the open expanse of the Pacific by the Kurile Islands. The western shores of the Sea of Okhotsk are partly formed by the island or peninsula of Tarkarai (or Saghainen), which projects at a very acute angle from the continent of Asia; and the islands of Jessy and Noguizza, according to the most recent information, attain a height of nearly 24,000 feet above the sea-level, and is the highest volcano on the globe. No active volcanoes occur in the Andes south of the volcano of S. Clemente, which is near 40° S. lat. With this summit begins the third group of the equatorial volcanoes, which extends from 30° S. lat. to 30° S. lat., where it terminates in the small volcano of Coquimbo. The number of active volcanoes in this group is about twenty; ten of them are between 40° and 35° S. lat. The most elevated is that of Aconcagua, near 32° 30', and the most recent eruption, in 1823, raised it to a height of nearly 24,000 feet above the sea-level, and is the highest volcano on the globe. No active volcanoes occur in the Andes between 30° and 22° S. lat. Between 22° and 21° S. lat. is the Volcano de Atacama, the commencement of the extensive range of the Andes west of the mountains of the North. This range descends to about 16° S. lat., which extends to near 2° S. lat., where the volcano of Sanguy forms the commencement of the group of the equatorial volcanoes, which extends to about 6° N. lat., or to the Paramo de Ruiz, which was active in 1828. The number of active volcanoes in this chain, according to the best record, is about ten; the most northern are in the chain of the Central Andes, between the valleys of the rivers Magdalena and Cauca. These are the three volcanic groups in the Andes of South America. On the Mexican Isthmus there are three groups of volcanoes, occurring between 3° 30' and 12° 30' N. lat. and 83° 30' and 104° W. long. The most eastern are the volcanoes of Costa Rica. On the table-land of that name, between 9° 30' and 10°, there are at least six active volcanoes close together. North of 11° N. lat. begins that of the Gulf of Nicoya, and south of 11° N. lat. are the volcanoes of the west, south, and north, and continue along the shores of the Pacific, and at a great distance from it, to the volcano of Soconusco (near 17° N. lat. and 94° W. long.). The number of active volcanoes in this group is uncertain. The third group lies across the Isthmus near 19° N. lat. and contains six active volcanoes. On the peninsula of California, one of the three summits called the Virgins is an active volcano, but it appears to stand alone. Mount S. Helena, situated at some distance from the Columbia river, is also said to be an active volcano. The chain of the Aleutian Islands, which contains more than twenty active volcanoes, connect as it were the American volcanoes with those of Asia. The most western volcano, situated on the island of Little Sitkin, is not much more than 600 miles from the series of volcanoes which line the island of Formosa. From the last-mentioned island the volcanic chain runs southward to the island of Luzon, where it descends a little to the east, traversing the peninsula of Camerinas (the southern part of Luzon), the other Philippine Islands and Mindanao, whence it passes to the north-western extremity of Celebes and the Moluccas. The last-mentioned islands exhibit everywhere traces of volcanic action, and contain several active volcanoes near 8° S. lat. The volcanic chain seems to terminate in that direction, or rather it turns northward nearly at a right angle, and continues through the Indian Ocean to the northern coast of New Guinea, and thence southward to the island of Tana. The most southern point of this lateral volcanic chain seems to be the small island called Matthew's Rock, south-south-east of Tana (22° 22' S. lat. and 171° 15' E. long.) In the northern island of New Zealand there are also unequivocal traces of volcanic agency. Thus we find that the western part of the Pacific is traversed by a volcanic chain, which extends from the neighbourhood of the northern polar circle nearly to the southern tropic, dividing the South Pacific into two parts.
eastern coast of Kamchatka. The volcanoes of the Aleutian Islands also partake more of the nature of the Asiatic chains than of the American groups.

Though the Pacific covers more than one half of the surface of the globe, it receives the drainage of a comparatively small part of the earth. In South America, the watershed between the rivers which run into the Pacific and the Atlantic is hardly a few miles from the shores of the former towards the southern extremity of that continent. North of 40° S. lat. it is widest, the Andes being nearly 100 miles wide. The Rio Biobio in Chile (37° S. lat.), but as they advance north, they approach nearer, and in all the remainder of South America the watershed is never more than 60 miles distant from the Pacific Ocean. Thus the Pacific receives not nearly so much of the drainage of South America. In the Mexican isthmus, as far west as the isthmus of Tehuantepec, the watershed continues at a short distance from the Pacific, never receding more than 40 miles, and frequently approaching it within less than 20 miles; but the isthmus of Tehuantepec it gradually recedes farther, and at 20° N. lat. more than 300 miles from the shores of the Pacific; but farther north it again approaches to a distance varying between 120 and 200 miles. The countries of the Pacific on the east side of which some important drainage to the Pacific, probably constitute not more than one-eighth of that division of America. In North America (north of 32° N. lat.) the watershed lies much more towards the interior of the continent, being between 35° and 45° about 750 miles farther north than the southern part, which is in the same latitude as the isthmus of Tehuantepec and is very near the Pacific from it. The area of the countries of North America whose drainage runs to the Pacific probably does not exceed one-fifth of the whole surface. According to this rough estimate, the Pacific receives not quite one-tenth of the drainage of America.

In Asia, the watershed between the rivers which fall into the Arctic Ocean on one side and into the Pacific on the other is likewise at no great distance from the latter, north of the mouth of the river Amur, but there it is farther north, between 50° and 55°, and continues for about 200 miles into the interior of Asia, and is followed on the south by the basins of the rivers Hoang-ho and Yantse-kiang, which reach somewhat farther inland. The basins of these three rivers, added to those of a few others, extend to about one-fifth of the total surface of Asia, and so much of the drainage of that continent enter the Pacific. In Australia, as far as the country has been explored, the line which divides the waters which run into the Pacific from those which run into the Indian Ocean is in the south near 35° lat., the shores are low, but rocky; they rise a few feet above high water-mark, and the rocks are covered with an alluvial soil. The low shores continue through the Isthmus of Panama, but they rise again to considerable heights where there is the table-land of Vargas projects like a vast promontory into the ocean. This high coast reaches as far west as the vicinity of Realejo, where a sandy shore extends for several miles. High volcanic mountains surround the Bay of Conchagua, but west of it follows a wide coast covered with an alluvial soil, which extends to the town of Tehuantepec. On the shores farther west the high land again comes close to the sea, forming a rocky coast of considerable elevation, which extends beyond 100° W. long. Then follows a low but probably rocky coast for 10° W., where the coast is high and elevated, extending to the port of San Blas. The eastern coasts of the Gulf of California are of moderate elevation and not rocky, and north of 28° N. lat. they become low and sandy; but the western shores of that gulf are rocky and elevated, except north of 30° N. lat., where a flat sandy beach extends to the mouth of the Rio Colorado. The western coasts of the peninsula of California rise with a steep rocky ascent to a considerable elevation, and the coasts preserve this character through the whole extent of North America, with the exception of the country surrounding the Bay of St. Francisco and a comparatively small tract of low country at the mouth of the Columbia river. North of the peninsula of Alaska, along the Kamchatka Sea, the shores are of moderate elevation, and in general rocky.

The coast of Asia along the western side of the Kamchatka Sea is very rocky, and in many places of great elevation; this description applies likewise to the coasts of the Sea of Okhotsk and the Japanese Sea. The western coast of Japan is very low, but the western shores of the Yellow Sea, or Haung-hai, are, with the exception of the peninsula of Shantung, very low, and consist partly of sand and partly of an alluvial earth; the latter principally occurs between the mouths of the rivers Yangtse and Hoang-ho. The coasts of China are rocky, but in general of no great height. The eastern coast of Australia, as far as it is known, is chiefly rocky, but it does not attain a great elevation.

Turning from the countries which surround the Pacific to the interior of the continent, the northern and southern portions are remarkably free from islands. In an extent of sea far exceeding the Atlantic in area and bordering on the western shores of America, only a few isolated islands occur, and one considerable group. During the voyage from the Galapagos Islands to the South American coasts, the only large island within 100 miles of the West Coast is the island of New Zealand, within 50 miles of the South American coasts, the only large island within 100 miles of the West Coast is the large island of New Zealand, which is partly in the west and partly in the east, and is one of the largest islands in the world. The islands of the Pacific are both low and elevated. The low islands are of very small extent, and are all within the latitude of 30° S. lat., and north of that latitude we enter upon a small space of sea. This enclosed space resembles a lagoon, and these islands are often called Lagoons Islands. It was formerly supposed that these islands owed their origin entirely to the mudspores and other marine animals; but it has been ascertained that these animals came in a depth of more than about ten fathoms, and as the islands rise with great steepness from a sea usually more than 300 fathoms deep, the question of the origin of these islands has engaged still more the attention of several naturalists. The Galapagos Islands are the largest, and generally rise to a great elevation in their centre. Besides the different groups which lie in a line from the eastern extremity of the Philippines to the Sandwich Islands, the Marquesas, Society, Navigators, Friendly Islands, and the Galapagos Islands, there are many small groups and isolated islands, which are encircled by coral-reefs, as the Society, Navigators, and Friendly Islands: others have not such a circle of reefs, as the Sandwich, Ladrone, Bonin Sims, Galapagos, New Georgia, and New Hebrides, which islands, which do not belong to the volcanic or lagoon islands are few in number: the largest of them is New Caledonia, for the northern of the New Zealand islands is volcanic, and as to the southern, we know nothing of it. A portion of the Pacific and the Philippine, Bering, and Japan Seas, the northern Sea, and determines its extent by assigning Papua and Luisiada as its northern boundary; whilst the north-eastern coast of Australia up to Sandy Point (21° 40' S. lat.) encloses it on the west, and on the south a line drawn from Cape York to Stanley Island. The coast is generally low, and very dangerous to the navigator. This is probably both the largest and the most extraordinary reef in any part of the world. It is divided from the continent of Australia by a space of sea free from islands, in general from 20 to 50 miles and in some places even 50 and 70 miles.
Easter Island, may have been first peopled from the west.

Before the beginning of the present century only a few vessels visited the Pacific, and the number has only increased considerably since the independence of South America was established in 1820: our knowledge of those points which more immediately affect the navigation, the winds and currents, is therefore far from being so complete as that which we possess of the Atlantic in these respects. Still enough has been ascertained to make us acquainted with the principal facts.

The north-east trade wind seems to be more regular than in the Atlantic, and its northern boundary does not vary so much. It is true that Cook, in passing from the Sandwich Islands to the coast of the North American continent, found the trade-wind as far north as 30° in the month of February; as other navigators have met it higher than 26° N. lat., it is probable that the wind which retarded the progress of Cook was a north-eastern wind of a changeable nature. Many later navigators met the trade-wind when the sun was in the southern hemisphere between 19° and 20° N. lat. and met it in summer this wind extends to 25° N. lat., and in winter only to 20° N. lat.; and that the mean boundary may be placed at 23° N. lat., from which it does not recede more than three degrees. As to the southern boundary of this wind, our knowledge is less accurate; a current of colder air, arising from the Cape of Good Hope, is the most probable to pass through the region of calms which intervenes between the two trade-winds, and that they avoid a course which is always attended with great delay. In the Atlantic the case differs, as events are continually occurring towards the Cape of Good Hope. Hope is obliged to pass the region of calms.

It is therefore merely a conjecture when it is stated that the southern boundary of the north-east trade-wind varies between 25° and 30° S. lat., and that the mean boundary is between 4° and 5° S. lat.

Respecting the south-eastern trade-wind, Capt. B. Hall states that near the continent of South America, when the sun is in the southern hemisphere, the trade-wind extends towards the south between 20° and 20° 5' S. lat., and at the commencement of this season it meets with five or four degrees farther north, near 25° S. lat. But Cook found that in the interior of the Pacific this trade-wind does not extend south of 26° S. lat., at least not when the sun is in the northern hemisphere. When the sun is in the opposite hemisphere, the regular trade-wind seems to advance to 25° or 26° S. lat. But according to several statements, it would appear that this wind is by no means so regular along its southern border as in the Atlantic, and that it is frequently interrupted by winds from the west and south-west.

In the Pacific, as in the Atlantic, the south-east trade-wind extends some degrees north of the equator when the sun is in the northern hemisphere. In the beginning of July, Capt. B. Hall met with it in 3° 30' N. lat.; and this is the season in which it may be considered as advancing farthest to the north. The last-mentioned navigator observes that towards their northern boundary these winds blow from the south, but farther south gradually draw more to the east, and at their southern limit are quite easterly. In the opposite season, the south-east trade-wind seems to recede from one to two degrees south of the equator, as is the case in the Atlantic Ocean.

The want of exact information respecting the southern boundary of this trade-wind renders it impossible to compare the extent of the Region of Calms in the Pacific with that in the Atlantic. It is certain that in the Pacific the central line of this region is north of the equator, but probably nearer to the line than in the Atlantic; near 5° N. lat. In the southern hemisphere, when the navigator meets with calms, interrupted by short squalls and accompanied by a little rain.

The south-east trade-wind is not met with near the coasts of South America, but only at a distance of from 300 to 400 miles. In the southern hemisphere, when the navigator is in the direction of the Andes from the south, changing during the day a few points to the west, and in the night freshening off from the land. These winds are always very violent, and, sometimes, are numerous. On the west coast of Guayaquil the winds always blow from the south-south-east, and are steady. The north-east trade-wind does not approach the coasts of the Mexican isthmus nearer than the southern shore of South America. It is only met with at a dis
stance of above 700 miles from the land. In the tract of sea lying between their eastern limit and the coast different winds prevail. Frequent gales in February, March, and November, both included, the prevailing wind is from the north-west and west; it is very boisterous, and frequently comes in heavy gales, and tornadoes or furious squalls, which are accompanied by deluge of rain. Strong north-west and north winds sometimes interrupted by calms. These winds set in earlier at the eastern parts of the isthmus than in the western. At Panama they are expected in March and, at S. Blas in the middle of June. During these seasons, from October to April, this coast is very dangerous, there are also few harbours, and even most of them are abandoned by the inhabitants on account of their unhealthiness. In the opposite season, from December to May included, the prevalent winds between Panama and Cape Blanco de Nieves are north-west and northerly, and they are pretty steady. From Cape Blanco de Nieves to some distance east of Acapulco the winds blow from east and north-east, generally with moderate strength, but they are sometimes interrupted by hard gales from the north-east, which are called Papa-gagos, and are experienced between Cape Blanco (9° 30' lat.) and Cape S. Catharine. They last for several days, with a clear sky overhead and a dense red haze near the horizon. Other gales of a similar description sometimes occur in this season east of Acapulco, opposite the isthmus of Tehuantepec, called Tehuantepec gales. They blow from the north. West of Acapulco, and from 60 to 100 miles from the land, the winds are variable, but the prevailing winds blow between south-south-east, and west-south-west. North-east and north winds are also common, and sea braving from the north-west during the day, and from north-east at night. They are experienced also east of Acapulco to a distance of about one hundred miles.

It seems that the trade-winds cease at a considerable distance from the coast both on the eastern and western coasts of the Isthmus. That in the tract of sea bordering on these coasts they are replaced by variable winds blowing generally from north-west and south-west, and also from south-east. But our information on this point is far too scanty to entitle us to speak even with a modicum of probability on the subject. We are, however, ignorant of the limits where these winds cease opposite the eastern coasts of Australia. They seem to blow as far west as the Corallian Sea, a portion of the ocean which is very seldom visited by vessels. Along the coasts of Australia the winds are very variable.

In the region of the variable winds, south of the trade-winds, the weather and the turn and succession of the winds are, according to Capt. Fitroy, remarkably uniform. Along the coast of Peru, north and south winds prevail, bringing clouds and rain in abundance. South-westernly succeed them, and partially clear the sky with their fury; then the wind moderates and blows from the south-east quarter, where, after a short interval of fine weather, it dies away and blows up from the north-east, freshening as they wear round to north, and augment the store of moisture which they always bring. From the north they soon shift to the usual quarter, north-west, and between that point and the south-west they shift back sometimes for weeks before they take another turn round. It never blows hard from east, rarely with any strength from north-east, but occasional gales may be expected in winter (between June and August) from south-east. Heavy tempests blow from west-north-west to south-west. In the region of the variable winds north of the trade-winds, the winds usually blow from the north-west and west, and frequently in gales. When not strong, they are accompanied with heavy fogs. It seems however that in the sub-tropical basins along the coast of South America, yellow, Japanese, and D호खাক Seas, easterly winds are prevalent. In the last-mentioned basin at least, east and south-east winds are constant in summer, and in winter are more frequent than other winds.

The effects of the winds of the Pacific on our information is still too scanty and doubtful. The winds, as far as they have been recorded, though numerous, are few when the immensity of the subject and the difficulties which arise from its peculiar nature are considered. These facts are also mostly dis-junctive, and it is almost impossible for us to come to any sound conclusion without conjecture and hypothesis. Consequently little can be said on this subject.

It is certain that near the southern polar circle a considerable portion of the surface of the ocean is in motion towards the north. This portion is situated between 140° and 200° W. long. North of 60° S. lat. it gradually turns eastward, and between 45° and 35° S. lat. it is directed towards the South Pole, the current seems to divide in the tract of sea west of the island of Mocha (33° S. lat.) and Cape Rumen (37°). The more narrow branch runs south-west towards Tierra del Fuego. It is frequently interrupted by deluge of rain, but the current seems to continue during, and before strong or lasting southerly winds. It continues along the southern coasts of Tierra del Fuego, to Cape Horn westward, and is found in this part run with an average rate of a mile an hour. Its strength is greatest in the straits of Magellan, and the current seems to become nearly imperceptible. As the current sets rather from the land, it diminishes the dangers which attend the navigation along such a rocky coast. Opposite the island of Mocha and Cape Rumen, and some distance west of them, the current, according to Capt. Fitroy, seems to turn to the north-west at the rate of from half a mile to a mile and a half an hour. But the current is not wide; and from 20 to 30 miles from the land, it is hardly perceptible. This however seems to be the beginning of the Peruvian current, which runs hence northward along the western coast of America as far north as Punta de Pariña (near 5° S. lat.). The current extends about 100 miles from the coast, and is of moderate velocity, generally not exceeding a mile an hour. This is called the coast current, and it is found to continue in all the regions I have given. The temperature of the surface of the ocean without the current is considerable. At Caliso the former indicates 62° Fahr., whilst in the same latitude the latter indicates 63° Fahr. The temperature of the surface of the sea is between 77° and 79°. From the Punta de Pariña the current recedes from the coast, running off in a north-western direction to the islands of Galápagos, enlarging in width, but increasing in velocity. Near these islands the coast current meets another current running between two and five miles an hour. Though the current has now reached the equator, its temperature has not increased. Along the southern shores of Albermarle Island, one of the Galápagos, the thermometer immersed in a sea of salt water, 55° 50', indicates 74° Fahr. The surface of the sea stands at 60°. The high temperature of the water on the north side seems to be the common temperature of the sea near the equator, but Capt. Fitroy ascribes it to a warmer body of water issuing from the Bay of Panama, which he considers the currents between 120° and 150° W. long. and between 3° and 10° N. lat. has been observed, which sets in an opposite direction eastward, but the facts are still too few to enable us to determine whether it is only the counter current of the Peruvian current or a current of its own.

The body of warmer water which, according to Capt. Fitroy, joins the Peruvian current near the Galápagos Islands, and which issues from the Bay of Panama, has been already mentioned. This current, which I have called the Mexican current, which runs along the coast of Central America and Mexico between 85° and 105° W. long. It is perceptible as far as 100 miles from the coast, but the current alternates. From December to April it runs eastward, and from May to November westward. The current is moderate, never exceeding one mile and a half an hour. The temperature of the water has not been determined, but it is supposed that it is warmer than that of the sea farther north. This is called the current. It is not found north of 14° 22' N. lat. in 135° W. long. This is the last permanent current which requires to be mentioned in the eastern portion of the Pacific south of the northern tropic.

The drift-current of the trade-winds seems to be much less rapid than in the Atlantic. According to Capt. Beechey it
does not exceed five miles per day. But where this drift-current approaches the western borders of the Pacific, especially the islands which lie between the north-eastern part of Australia and the south-western coasts of China, and which occupy a space of 38 degrees of latitude, it begins to divide into several currents of greater velocity, among which three are noticed particularly. The most southern seems to separate from the drift-current between the Friendly and Fanning Islands, and to run to the New Hebrides and New Caledonia, but it appears to be lost before it reaches the Coralian Sea. Little is known of it. The second lies much farther north, between the equator and 5° or 9° N. lat., and runs along the northern coast of the island of Amapulo, between 30° and 40° W. long., and to run near 150° E. long., and terminates in the straits which divide the western extremity of Papua from Gilolo. This current is influenced by the monsoons prevalent in that sea, so that during the south-west monsoon it sets eastward, and westward, during the north-eastern monsoon; it frequently runs with very great velocity, especially in the western portion. The third current, which branches off from the drift-current of the trade-winds, is observed along the northern border of this region. It sets westward with moderate strength, and from the south-western parts of the Philippines Islands and Japan opposite the island of Formosa. Its width is not well ascertained.

South of the trade-winds and without their reach, a current is observed along the eastern coast of Australia, south of Sandy Point. It is called the east current, and it always sets southward; but the more accurate investigation of Jeffreys shows, that from 28° S. lat. to the southern extremity of Tasmania, or Van Diemen's Land, the current during the summer, or from August to May, sets along the coast, and seaward to a distance of 15 or 18 miles, to the west of south, with a force of about one mile and a quarter an hour; but at the distance of between 18 and 40 miles, to the east of north, running about three-quarters of a mile an hour, and back to the sea, running the opposite direction. This is partly confirmed by Captain Fitzroy, who says, that in the passage from New Zealand to Sydney he found alternately northward and southward currents, and that while the stream set from the south and north along the coast of New Zealand 72°, but when the current ran from the south only 67°.

North of the drift of the trade-winds, a constant current is found along the southern coast of Japan eastward, and to decline at about 145° E. long., to the north. It runs without any change, and is thus made in the middle of the distance from the shores. Whether this current, like the Gulf-stream in the Atlantic, traverses the whole breadth of the Pacific, is not known; but a strong current setting in an easterly direction in this portion of the Pacific was experienced by Captain Fitzroy, on the 24th of July, 1837, who had been set five degrees of longitude in 18 days, or about 14 miles a day; and a current of similar strength seems to run along the northern coast of America from 55° to 30° N. lat., but along these shores it sets south-east.

It is said and joins another current which is connected with the current in Behring's Strait, but it is certain that a strong current sets through this Strait northward, or rather north-eastward. It is strongest on the Asiatic shore, where it runs from two to three miles an hour, but on the American shore only one mile and a half on an average. This current prevents the masses of ice which surround the arctic pole from advancing southward and spreading into the Kamitchkata Sea; it presses them together in one current, either along the coast of Asia and America, where they constitute an impenetrable barrier, and render abortive the attempts of the most skillful and boldest navigator to advance nearer to the pole.

The tracks kept by vessels in navigating a sea are of course not uniform, but may reach by a straight line the present course of the direction of the winds and currents. We shall mention the most important of these tracks. Vessels bound from Valparaíso or any other port of Chile, for Callao or Guayaquil, keep along the shore of South America at no great distance from the land, as in these parts both winds and currents are always in their favour, both being to the north. But in the voyage from Callao and Guayaquil both the wind and current are contrary, and accordingly vessels after leaving these ports sail south-west or west-south-westward, and in distances of 300 or 400 miles from the land, they meet the trade-wind, by means of which they make southing until they get out of the trade-wind into the region of the variable winds, when they direct their course to the place for which they are bound. In winter they keep them southward until they sail southward to 30° or 31° S. lat., before they endeavour to make some port, and in summer only to 23° S. lat.

In sailing from the ports of Peru and Chile to those of Amapulo, S. Blas, and Guayaquil, three different tracks are followed. From the latter, their course from Peru to Mexico generally lies nearly continuous, and within the Mexican current, as this current sets westward during this season, and the winds along this coast are partly favourable. But in returning in the same season to Callao or Guayaquil, they set south of the current of the south-east; more, and then, by means of the trade-winds and the prevailing currents, they try to make southing or nothing, according to the direction of their voyage. This tract is called navigation por afuera. This course is chiefly kept by vessels sailing from the ports of Mexico to the Cocos Islands of the South Pacific. Those which sail from Mexico to Guayaquil or Callao keep closer to the shores of Central America, and when they have passed the Bay of Panama, they shape their course to the place of destination. This tract is called the seamen's joint, or, as it is called by the natives, the descurviation of the st. martiniano.

But from May to November the track of the sea along this coast is subject to hard gales and squalls and extremely bad weather, and the navigation is accordingly unsafe, and is avoided. During this season the vessels draw further from the distance of the coast and take more southing, and more, and then, by means of the trade-winds and the prevailing currents, they try to make southing or nothing, according to the direction of their voyage. This tract is called navigation por afuera. This course is chiefly kept by vessels sailing from the ports of Mexico to the Cocos Islands of the South Pacific. Those which sail from Mexico to Guayaquil or Callao keep closer to the shores of Central America, and when they have passed the Bay of Panama, they shape their course to the place of destination. This tract is called the seamen's joint, or, as it is called by the natives, the descurviation of the st. martiniano.

The track most frequented in traversing the whole expanse of the Pacific from east to west, lies in the eastern portion of the ocean, in a south-eastern and north-western direction. Vessels leaving the ports of Mexico sail as far as South America, to the south of latitude 30° N., until they reach 20° N. lat., about ten degrees east of the Sandwich Islands. These islands, lying nearly in the middle of the track between the South Sea and the Chinese Sea, are commonly resorted to for refreshments.

The trade-winds from the Sandwich Islands, to the north-west, eastern Pacific, and the Chinese Sea is entered by the straits between the islands of Luzon and that of Formosa. This is the northern track across the Pacific, and it is considered the shorter, because the voyage is made by steps of five to seven days each, as the latter is really somewhat shorter, but as it lies through a sea beset with numerous low islands and reefs, the vessels are exposed to much more danger, and the precautions necessary to avoid them cause a delay which renders the voyage longer than by the northern route. This is the great thoroughfare across the Pacific runs between the Paumutu Islands on the south and the Marquesas on the north, and lies mostly in the southern hemisphere, cutting the equator near 165° E. long., whereas it continues north-westwards until it arrives at 180° or the International Date Line. These two lines are followed by vessels from the coast of South America; the northern also is followed by those from Central America and Mexico bound for China and the East Indies. But in these parts of the ocean the winds and currents being to the west, vessels which follow them on their return to America would meet with great delays, and therefore the tracks which they follow in sailing eastward lie beyond the limit of the trade-winds and their current, and to the south of latitude 30° N. to 35° N. lat. Vessels sailing from the Chinese Sea to the ports of Mexico or the western coast of North America, and having passed either to the south or north of the island of Formosa, and usually on the north during the south-west monsoon, and on the south during the north-east monsoon, are forced to make a turn to the west, and keep along the coast, south-east of the islands, and their winds and currents are not felt. In keeping north of 30° N. lat. they traverse a sea free from islands and dangers, and make the coast of the peninsula of California south of 30°, whence they direct their course to the port for which they are bound. Vessels sailing from the West Coast of America pass between New Zealand on the south and Norfolk Island on the north, and keep an easterly course until they arrive south of the coast of South America, where the trade-winds do not blow and the current sets north. On arriving there, they reach their destination by the tracks already mentioned.

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With respect to vessels sailing from Sidney to the Indian Archipelago, they may make the Western Passage, which lies through Bass's Strait and round Australia through the Indian Sea, or they may make the Eastern Passage. The Indian Eastern Passage, which lies along the eastern coast of Australia and leads through Torres Strait. This passage is far the shortest, but it is rarely used by vessels sailing to India, on account of the numerous dangers to be encountered in the long and narrow strait between the rocky coasts of Australia and the Papuan coast. This passage is, therefore, through this part of the sea has been surveyed and laid down with great accuracy by Flinders. In the only season in which it could be navigated, with advantage, that is during the north-west monsoon, the dangers are increased by the heavy fogs of the sea caused by variable winds. The Outer Eastern Passage however is frequently used by vessels sailing from Sydney to India. In sailing along this track, a vessel after leaving Sydney runs eastward till it has passed to the east of the New Caledonia and the New Hebrides on the east, until it gets near the New Georgian Archipelago. It then sails along the southern border of this archipelago, but at some distance from it, and passes through St. George's Channel between New Georgia and New Ireland. The tracks of these vessels are: first, the runs along the northern coasts of Papua and enters the Indian Sea either by Gallowa Strait between Papua and the small island of Salla-waty, or by Pitt's Strait between Sallawaty and Batante, another small island. Through the north Movement of the Pacific Ocean is frequent from Sydney to the Indian Archipelago or Bengal, it is not used by vessels sailing in an opposite direction, which always prefer the Western Passage round Australia. It has been already observed, that the current which sets north through Behring's Strait prevents the ice of the Arctic Polar Sea from passing southward into the Kamchatka Sea. It may be added, that the floating masses of ice of the Antarctic Polar Sea are frequented with contrary to the coast, but being in the southern latitudes, between 50° and 60°, and between 140° and 200° W. long., and even north of 50°. Farther west, in the sea south of Australia, it is supposed that ice never passes beyond 50° S. lat.

See also: Flinders's Voyage to Terra Australis; Bass's Extracts from a Journal written on the Coasts of Chile, &c.; Koetze's Voyage of Discovery, and Second Voyage round the World; Krusenstern's Voyage round the World, and Memoirs; &c.; Beechey's Voyage to Terra Australis; &c.; Phips's The Narrative of the Surveying Voyages of the Adventure and Beagle; Humboldt's Essai Politique sur la Nouvelle Espagne; Meyer's Reise um die Welt; Krusenstern's Atlas des Pflanzenreiches; Dupuytren's Reise um den Grossen Ozean; Joffry's; and René's General Chart of Terra Australis; Berghaus's Physikalischer Atlas.

PACIO, GIULIO, born in 1550, at Vicenza, in the Venetian state, learned Latin, Greek, and Hebrew at an early age, and soon became acquainted with every branch of classical learning. Being accused before the ecclesiastical authorities of reading books forbidden by the church of Rome, he became alarmed, and escaped to Switzerland, where he earned his living as a teacher. He was afterwards appointed professor of philosophy at Heidelberg, where he assumed the name of 'Pacius Beris', from a country-house belonging to his family near Vicenza. He travelled through Germany and Hungary, and after some years he was invited by the duke of Bologna to his newly established university of Sèdán, where he taught philosophy with great success; but the civil wars raging in that part of the country, he removed to Nîmes, and thence to Montpellier, where he was made professor of law in that university. In 1585, he was made bishop of Dijon. The church of Montpellier was one of his dioceses. Henri IV. restored on Pacius the honorary rank of king's counsellor. Pacius had long professed the reformed religion, and Ferreze earnestly but unsuccessfully attempted to induce him to settle near him at Arles, and to return to the church of the Roman Catholics. Pacius removed to the university of Valence in Dauphine, where his reputation as a jurist increased and spread throughout Europe. He was offered chairs at Leyden, Pisa, and Padua. He chose the last university, where he was received with great honours, and the Venetian senate made him a knight of St. Mark. After some time however he returned to his family, which he had left at Valence, where he died in 1633. A friend wrote the following eulogium for his monument—

Dala dei cuomi tellaus, Germanica Romano, Gallia sc Jovis: die mihi qua patris?

Pacio wrote many treatises and commentaries on the Roman law; among others: 1. 'De Juris Methodo Lunis Duo.' 2. 'Juris Civilis Romana Inquit et Progressus.' containing a Commentary on the two books of 'Notes on Fragments of Ulpian and Gaius, on Pompnoius 'De Origine Juris,' and upon the last two titles of the Pandects. 3. 'Pictura duæ de Gradibus secundum Juris Civile et Canonnicum.' 4. 'De Contractibus.' 5. 'De Pacta et Transacta, de Sucessu, de Recusandae Feudorum.' Pacius also edited also the following works— 8. 'Corpus Juris Civilis cum Notis et Legum Argumentis.' fol. Geneva, 1580. 9. 'Justinitia Imperatorum Institutionum Libri IV.' 10. 'Sapphentissimi Europalate de Officinalibus Practicis Manualibus, quae in his Monopolis in Elisabeth.' Greek and Latin, Heidelberg, 1588. He also published several editions of the 'Organon' of Aristotle, of which he made a new Latin translation. He also edited the works of Aristotle, in 2 vols., 5to, 1577. His other works were published under various titles. His De Aristotelis Organon Commentaria analiticus, 4to, Frankfort, 1587; 12. 'De Dominio Mariae Hadratrici inter Serenissimam Regem Hispasirum ob Regnum Nepopolitum et Serenissimam Rempublicum Venetam,' Lyons, 1619. In this curious work he defends with great skill the dominion asserted by the Venetian republic in the Adriatic Sea as far as Cape Leuca, on the several grounds of old prescription, of having its territories round the greater part of that gulf, on the obligation of keeping it free from pirates, and of the only navis argivas of the Venetian republic. The work is interesting, as affecting other similar questions of 'mare clausum' and the rights of dominion claimed by other powers over the narrow seas near their coasts. 13. 'Last, on Pacius's death was published at Amsterdam, in 1643, 'Posthumae Paci sei, seu Definitiones Juris ustruirique.'

(Lorenzo Cassio, Elpis de Uominii Letterari; Thomasin, Elpis Doctorum; Gassendi, Vita Petreantic.)

PACIOTTO, De Montfort's, a French of the genus of Belemnitae, composed of those species which are described as being curved towards the extremity, with a pore at the apex, and a straight elongated aperture. Belemnitae unguiculata of De Blainville is an example.

PACTUOLI (Pacitiiu), by which M. Milne Edwards designates a tribe of the Apterous family of the Aconitcea section of crustaceans. The other tribes belonging to this family are the Dromiinae, the Homolidae, the Romaninae, the Porcellaninae, the Hypogastrinae, and the Pogonurinae. This tribe is very characteristic of our Biennial list of leading generic names, such as Hippa; Hippa Thr: The Pactolians are placed by the author above mentioned between the Homolidae and the Pogonurinae.

But it is not without some uncertainty that M. Milne Edwards gives the name of the Order of the ottrnaria described by Dr. Leach under the name of Pactolus. In the conformation of the corapace, the mouth, and the addenes, indeed, it resembles one of the Oxyurhy; but in the structure of its feet there are anomalies which distinguish it from the Decapoda. This animal is of the least, whilst the two last pairs are terminated by a didactylov claw. Upon this form the family entirely depends, and the genus, however we might add species, is known.

Pactolus.

Generic Character.—First joint of the extremal antenna long and cylindrical. Feet moderately long and rather slender. Pores on the abdomen not connecti- nated by a manus or pincers, but only provided with a simple hooked nail: the second pair terminated in the same way; the third pair unknown; fourth and fifth pair didactylov. C (x) cornea triangular, elongated, rather convex on each side, behind, not thought above, and terminated anteriorly by a very long, sharp, delicate and entire rostrum, similar to that of the L. sp. (Macroderena. vol. XIV., p. 525.)

Achomen of the female composed of five joints, the first narrow, the three following transverse and linear, and the fifth very large and nearly rounded, from very long, sessile
and behind the antennæ, always projecting from their
feet: a single point behind each orbit.

Example: Pachytus Boscii. Length eight lines, nearly
two of which belong to the rostrum, which is furnished with
small spinose directed obliquely on the sides; carapace
smooth, brownish; feet variegated with ruddy and whitish.
Country unknown.

PACTOLUS. [LYCIA.]

PACUVIUS, MARCUS, a native of Brundisium, a
Latin dramatic poet, and the nephew of Rutilus, also dis-
tinguished himself as a painter. He was born about 219
b.c. Pliny (Hist. Nat., xxxv, 4, 7) mentions some works ex-
cepted in his temple of Hercules, in the Forum Boa-
rium at Rome, which apparently did consider his honour;
he remarks at the same time that he was the last who
painted with hands profite (‘honestis mambusis’), with the
exception perhaps of Tuirlius Labeo of Verona, a Roman
knight of the Praetorian guard. Fifty years later, Cicero,
derived from the fragments of Pacuvius are still ex-
tant, and according to Quintilian (Inst. Or., x. 1) they were
not without their merits. He died at Tarentum in the 90th
year of his age. He wrote a simple epitaph upon himself, which
has been preserved by Attius Gellius (l. 242): ‘Adolescens,
temenatae properas, te hoc saxum rogat, uti ad se adspicias,
dende quod scriptum est, legas. Hie sunt poetae Pacuvii
Marci aia oas. Hic voebalem; nescius ne esses: vale.’ The
Fragments of Pacuvius were collected by Henry Stephens,
Paris, 1834, 8vo.; and have since been printed in several
editions of the Corpus Poetarum Latinarum. Cicero, in
his treatise ‘On Friendship’ (c. 7), introduces Lucius as
speaking in terms of commendation of the ‘Orestes’ of his
friend Pacuvius. Pacuvius, fifty years later, writes of
Attius, who exhibited a play in his thirtieth year, at the
same time that Pacuvius, then in his eightieth year, ex-
hibited one. (Cic. Brut., c. 64.)

PADANG. [Sumatra.]

PADDINGTON. [LONDON.]

PADDY BIRD. [RICK BIRD.]

PADERBORN, formerly a bishopric of the German
crown, in the circle of Westphalia, was assigned to Prussia
in 1802: it is now divided among the three governments
in which the former province of Westphalia; the por-
tion still called Paderborn is a circle of the government
of Minden. It is bounded by some of the Egge Moun-
tains, but on the whole it is level, and has extensive heaths
and marshes. The soil is fertile, but does not produce su-
cient corn for the home consumption. Much hemp is grown,
the forests are considerable; the inhabitants breed great
numbers of sheep and swine; the mineral products are coals,
iron, and salt.

PADERBORN, the capital of the circle, in 51° 41' N. lat.
and 9° 34' E. long., is situated on the river Pader, from which
it has its name, signifying ‘the source of the Pader.’
This river is formed by five springs that run under the cathedral
and the adjacent houses. It is surrounded with walls
and has five gates. The houses of Paderborn are tolerably
well built. This town is the residence of the bishop, who
founded the bishopric. The building of the cathedral was
begun in the year 777; it was destroyed by fire in 1000. A
new cathedral was completed in 1015, but the chapel of St.
Bartolomew is the only part of it that remains. The
present cathedral was built in the twelfth and fourteenth cen-
turies, and underwent many changes in the fifteenth, six-
teenth, and seventeenth centuries. The steeple was built
by Kielmayer in 1815. The cathedral contains the remains
of Sibylla of St. Leodegar, brought from Augsburg in
1568, in a coffer of silver gilt. It formerly possessed, besides other
treasures, the golden images of the twelve apostles, which
Duke Christian of Brunswick, who took the city in 1620,
carried away with him, as well as the silver coffins, which
at that time contained the body of the saint, and which he
coined into dollars, with the legend, ‘The friend of God
and the enemy of the priests.’ There are three other Roman
Catholic churches and one Protestant church, a seminary for
priests, a Catholic school, and a Jesuit college, besides
numerous useful and charitable institutions. It is still the see
of a bishop and chapter. The university, founded in 1323,
was abolished in 1819, and the funds applied to the gymnasia at
Paderborn and Minden.

Paderborn was the residence of the Hanse towns, and a free
imperial city, but became subject to the bishop and chapter,
and the capital of the bishopric. The inhabitants, 1000
in number, have no manufactures of importance, but exten-
se breweries and distilleries, and a considerable inland trade.

PADILLA, a city in the province of PEF, in the
insurrection in Castile against the ministers of Charles V.,
known as La Guerra de las Comunidades, was the son of
Pedro Lopez, a nobleman who held the high office of Ade-
siantado Mayor of that kingdom. After the death of Fer-
andez V. (1510), he assumed the regency of his son, and,
together with the extensive possessions dependent on them in
Europe, as well as in Africa and America, devoted upon
his grandson Charles, then in his sixteenth year. [CHARLES V.]
The young prince appointed Adrian of Utrecht to
be his minister in Castile. This proceeding was not
aversion of the Spaniards to the government of a stranger,
that Adrian’s claim would at once have been rejected, had
not the celebrated Cardinal Ximenez [CIGARO] consented to
acknowledge him as regent, and carry on the government
in conjunction with the Crown. Yet the young prince,
who associates in the administration soon rendered themselves
exceedingly obnoxious by their utter incapacity, their cor-
rupcion, and their gripping avarice. The laws of the kingdom
were completely disregarded, the high offices of the state
either given to foreigners or sold to the highest bidder; and
the revenue of Spain, instead of being spent at home, found
its way into Germany: the sovereign himself, who was far
from his natural dominions, was a candidate for the imperial
crown, then vacant on the death of Charles V., which
urged the discontent of the Castilians. All these causes of discontent, increased by Charles’s
disregard for the remonstrances sent him by the Cortes,
spread widely through the Peninsula. The city of Toledo
was the first to show symptoms of rebellion. On the arrival
of the Cortes, those of Avila, the Cortes assembled there the oath of allegiance as heir to
the crown of Castile, the deputies of Toledo were entrusted
by their constituents with a lengthy memorial containing
their grievances. Though Charles did not openly deny
their petition, he referred them to the Cortes about to
be assembled at Santiago, and quitted Spain to take possession
of the Imperial crown.

When the people of Toledo heard that the deputies
assembled in Galicia had voted the emperor a free gift with
the intention of obtaining the Cortes and many of the
members of the Cortes that had assembled at Valladolid, then the capital of Spain, sent a body
of troops under Ronquillo, to chastise the rebels; but while he was besieging Segovia, Padilla, with a body of insurgents from
Toledo, came to the assistance of the citizens, and de-
ja usted. On the death of Charles V. his mother, resided since the death of her
husband. Being admitted to the presence of the princess,
who had long been in a state of mental debility, Padilla and
his followers renounced the authority of the regent, and placed her at the head of the government. From thence they proceeded to Valladolid, and deposit von the archives and the seals of the kingdom. The Junta then drew up a long list of conditions for ending a state of their grievances, and sent with two of their number to the emperor. Everything now augured success to the cause of popular liberty, but dissension soon broke out in the ranks of its supporters. The Junta, relying on the unanimity which had inspired confidence in their proposals, and seeing no royalist forces on the field to obstruct their designs, began seriously to think of reforming several political abuses, and various measures were proposed and carried to less of the people and the Junta, in the name of the throne and at the prerogatives of the crown. This produced a union of the nobility with the royalists. The Junta, who now became jealous of Padilla’s popularity, deprived him of his command of their forces, and appointed Don Pedro Guevara, the son of the deposed archbishop, to the command of the Junta prisoners. This severe blow was followed by the immediate disbandment of the insurgents and the loss of their general, who, betraying the cause of the people, passed over to the royalists. Padilla was now raised to the rank of captain general of the royal army. He made various small encounters, and by means of skilful manoeuvres succeeded in avoiding a general engagement with the veteran troops of Charles; but at length the royalists, closing upon him on all sides, was obliged to hazard a battle, in which he was completely defeated at Villalba, 23rd of April, 1521.

Padilla, who had been severely wounded in the conflict, was made prisoner, together with some of his principal officers. He was brought before the Junta on the day that the battle was fought. Sandoval, and after him Dr. Roberts, have preserved us two letters, full of eloquence and sprit, which the illustrious martyr of liberty wrote a few hours previous to his execution; one addressed to the deposed archbishop, and the other to his son Don Carlos Pacheco, in which are some remarkable passages breathing respect and filial love towards his father Pedro Lopez, who fought against him under the royal banners.

PADILLA, DONA MARIA PACHECO DE, the offspring of one of the most illustrious families in Spain, was executed on the 23d of April, 1521, before the tribunal of Padilla, and with all the formalities of legal process, she embraced, and whose cause she most strenuously defended. After the execution of her husband, she swore to support the sinking cause of the people, and to revenge his fate. The citizens of Toledo, who had learned on former occasions, by their own experience, what was the defence of their rights. The prudence and vigour with which she acted justified the confidence placed in her. She wrote to the general of the French, who had just invaded Navarre, begging them to stop a while, promising him her powerful aid. In order to procure the money requisite for raising an army, she went in person to the cathedral of Toledo, where a vast treasure of ecclesiastical wealth was preserved; and entered the temple in solemn procession with all the uncanny sores of the town, accompanied by the solemn persons, “with the keys of the sacred deposit. She moreover adroitly put into practice every artifice that could interest or inflame the populace. For this purpose she ordered her troops to use crucifixes instead of crosses, and she marched through the streets with her son, a young child, dressed in the deepest mourning, seated on a mule, and having a standard carried before him, on which was represented his father’s execution. All her efforts were however fruitless: the French gained possession of the city, and Padilla, who commanded the forces of the Junta in Toledo, was speedily crushed in other parts of the Peninsula. By the total discomfiture of the French, who were obliged to repass the Pyrenees in haste, all the royalist forces were brought into operation; and the last refuge of the Comuneros, was invested. Though she defended herself with the greatest courage for four months within the walls of the citadel, the clergy, whom she had highly offended by her spoliations, ceasing to give her their support, she was obliged to surrender that fortress. It appears however, that the means by which she was induced to do so was by means of a false message from her son Don Carlos, who had fled to Portugal, where she passed the remainder of her days. Thus ended this bold though unsuccessful attempt of the commons to assert their rights, which contributed greatly to increase and extend the power of the crown. With the exception of the graphic and admirable sketch by Dr. Robertson, in his ‘History of Charles V.,’ we possess no other history of these important events but what has been preserved by the Spanish writers, who are all in favour of the rights of the crown. There are in the library of the British Museum two inquisitions relating to these wars, which were unknown to Dr. Robertson. Martinez de la Rosa is the author of a tragedy entitled ‘Maria de Padilla.’

(Relacion de las Comunidades, MS. Bib. Beerton, in the British Museum, and a fac-simile in the Library de la玺a, ib., No. 310; Robertson’s ‘Charles V.,’ vol. ii. (sixth edit.), Sandoval, Hist. de Carlos V. ; Martinez de la Rosa, Boeux de la Guerra de las Comunidades, vol. iii.)

PADILLA, LORENZO DE, one of the historiographers of Charles V., was born at Antequera, a town of mixture towards the end of the fifteenth century. When still young he was, owing to his eminent virtues and profound learning, raised to the dignity of archbishop of Ronda in the diocese of Malaga. At the same time he was appointed tutor to the king and later general of the Order of the Galleys. The object of his studies was entirely to the study of the antiquities and history of his native country. Padilla died in 1540, leaving behind him a general history of Spain, divided into four parts, a few sheets of which have been printed, according to Nicolas Antonio, ‘Historia de la conquerida General de los Reyes Catolicos con los reynos de lasIndias.’ Besides the above works, Padilla wrote the following: ‘Catalogo de los Santos de España,’ Toledo, 1598, fol. and ‘Libro de las Antiguedades de España,’ afterwards edited by Pellicer, Valencia, 1669, 12mo. The following are still in manuscript: ‘Historia de la conquista de las Indias,’ ‘Origen de las Provincias de la Casa de Austria hasta el Rey Don Felipe,’ 4, ‘Catalogo de los Arzobispos de Toledo.’ (Nicolaus Antonio, Bib. Nov. Script. Hic., vol. iv. p. 143.)

PADOLLUS, De Montfort’s name for those species of the genus Halotis which are distinguished by a parallel ribb hollowed interiorly. &c. [HALOTID. vol. i. p. 167.]

PA'DOVA, THE PROVINCE OF, called by the English Padua, one of the provinces of the Lumbard Venetian kingdom, is bounded on the north by the province of Treviso, on the east by that of Venice, on the south by that of Verona, and on the west by the provinces of Vicenza and Belluno. The province of Padua is composed of the city of Padua, a plain crossed by the rivers Brenta, Bacchiglione, and Sile, and sloping to the eastward towards the lagoons of Venice. The Adige forms the southern boundary of the province, and divides it from that of Treviso. A small part of the territory, about one-twentieth, is occupied by a range of hills called the Euganean Hills, which are of volcanic formation and well cultivated; they run south-west of the city of Padua, and divide the waters of the Bacchiglione into two branches. The capital of the Adige, which is about 40 miles from north to south, and its greatest breadth is about 30 miles, but in other places it does not exceed 15 miles. The area is reckoned at 536 square miles. (Quadri, Prospetto Statistico delle province Venete.) The province of Padua is in the north part of the Lumbard, and one of the larger populated of the Venetian provinces which now form part of Austrian Italy. The population in 1833 was estimated at 298,000 inhabitants. (Serrator, Saggio Statistico dell’Italia, 1840. The province is divided into twelve districts, namely, Padova, Monfalc, Montagnana Est, Montagnana Ovest, Monfalc, Piazzola, Teolo, Bataglia, Corsele, and Pove, which contain in all 193 communes. A number of canals, some for navigation and others for irrigation, intersect the province, which produces wheat, Indian corn, pulse, oil, wine, flax, hemp, hops, potatoes, fruits, and hay. The number of bovine cattle is reckoned at
PAD

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about 45,000 head, that of horses at 8000, sheep at 52,000, and swine at 20,000. The other products of the country are silk, wool, wax, and honey. The manufactories are few, and consist chiefly of textile, silk spinners, woolen cloth, and hats. The city of Padova has several presses for printing and engraving.

The principal towns are the following: Padova; Este, a town of about 80,000 inhabitants; Vicenza, with about 50,000 inhabitants; Montagnana, with about 8000 inhabitants, has some tanneries and hat manufactories; Abano, with 3000 inhabitants, is noted for its mineral waters and mud, of which Stewart Rose gives a description in his "Italian Itineraries," and from which he obtained a supply of the能够 for its mineral springs. Near Battaglia are the fine mansion and grounds called "Il Ca' di Canale," which belonged to the noble family of Obizzi, the last of whom bequeathed it to the present duke of Modena. A few miles from it is the village of Arquà, in a delightful situation, in the Euganean Hills. Arquà contains the house in which Petrarch breathed his last:

``They keep his dust in Arquà, where he died;
O sweetest village where his latter days
Went down the vale of years; and 'tis their pride
An honest pride—and let it be their praise,
To offer to the passing stranger's ear
His mansion and his sepulcher: both plain
And venerable alike; as many as a day's
A feeling more accordant with his strain
Then if a pyramid form'd his monumental base."

—Childe Harold," canto iv.

PA'DOVA, in English Padua, the ancient Patavium, a town of the Veneti, known as the birthplace of the historian Livy, and now a town of the Lombardo-Venetian kingdom, is one of Italy's few with a coffee-house and gardens, and in the E. long. The river Bacchiglione flows by its walls. Padova is fortified with walls, ditches, and bastions, and is above six miles in circumference; but it is thinly inhabited, the population not exceeding 47,000 inhabitants (Serrariari, Saggio Storico). The university of Padova, ancient and renowned, has some good paintings and several sepulchral monuments of learned men, among others that of Sperone Speroni, a philosopher, orator, and poet of the sixteenth century; and a bust of Petrarch. The baptistery, which is detached from the church, has some fine old paintings of the Florentine school. 2. The episcopal palace also has some valuable paintings, among others a bust of Petrarch a fresco, which was cut out of the wall of the poet's house, and is considered the best likeness in Italy. 3. The church of St. Anthony, built in honor of St. Anthony of Padua and of the saint's patron, has some fine old paintings and the tombs of the saint and other ornaments, besides containing some sepulchral monuments of illustrious men, such as Benito, the patron Costantini, Cessotti, and others. The altar of the titular saint, situated in the choir, contains a number of more or less numerous offerings made by the pious, was partly stripped of its riches by the French in 1797. St. Anthony is the patron saint of Padova, and his church is one of the most splendid in Italy. In the square before the church is a fine bronze equestrian statue of Gattamelata, captain-general of the Venetian troops, by Donatello. 3. The church of Santa Giustina, a handsome piece of architecture, with eight domes and numerous chapels and paintings; its ancient and valuable library was sold in 1816 by Napoleon's government, to purchase arms, and is now scattered abroad, and possessed by various individuals. 4. The church of the Eremitani, built in the thirteenth century, contains several remarkable old fresco paintings, and some sepulchral monuments of the family of Carra, once the rulers of Padua. Padova has many other churches, among them the cathedral and the basilica of St. Croce. Describes monument to the tomb of Father Stellini, a man of vast and marvellous erudition, a poet, mathematician, and metaphysician, one of the profoundest thinkers that Italy has produced, and yet he is nearly forgotten in his own country. 5. The building of the university, called the palace, is large and commodious, having a court, with a range of galleries above one another, an anatomical theatre, a cabinet of natural history begun by Vallisneri, a library opened, and his collection dispersed, in 1754, upwards of 70,000 volumes. There are several colleges in various parts of the town. The university, which is one of the principal in Italy, was founded by the emperor Frederick II. in the first part of the thirteenth century. It flourished most after Padua came under the dominion of Venice, when it had six thousand members. The number of students is now about one thousand. There are about sixty professors, several of whom are well known in the scientific world. A rector, annually chosen from the body of professors, is at the head of the university. The university has four faculties: theology, law, medicine, and philosophy. 6. The clerical college and seminary of Padua is noted for its printing-presses, which have long supplied Italy with school books, and with good editions of other works. At Padua Forecellini compiled and published his great Latin Lexicon, the most important work of its kind for nearly a hundred years. The library of Padua contains 55,000 printed volumes and about 800 MSS. 7. The palace of justice, "palazzo della ragione," or town-house, is a vast structure: the great hall, the largest in Europe, is nearly 300 feet long, 100 feet wide, and 100 feet high; it is ornamented with frescoes and other monuments of illustrious Paduans, among others one raised in honour of Livy, and another to Belzoni, with two Egyptian statues of granite given by that traveller to his native city. At one end of the hall is the "lapis vituperi" mentioned by Addison: it is a seat of black stone upon which insolvent debtors were obliged to sit with their bare posteriors, as in other towns of Italy, in the middle ages. 8. The palace called "del Capitanio," once the residence of the Carrara family, is remarkable for its handsome gate, its great court, and its tower. 9. The library of the University of Padua is the finest of this palace. 9. The palace Giustiniani is remarkable for its fine architecture among the other palaces of the Paduan nobility. 10. The new building, called "the Caffè Pedrocchi," is a very handsome one, and is entirely cased externally and internally with marble, and is one of the most splendid establishments of the kind in Europe.

The Prato della Valle, or public promenade, is adorned with several statuary and distinguished Italian academies of sciences, letters, and arts of Padova, instituted in 1779, publishes its memoirs, which form nine or ten volumes. Besides the learned men to whom Padua has given birth, Petrarch resided here a long time, holding a curacy in the cathedral, and had a close relationship with the Carrara family. Galileo was for eighteen years professor in the university.

Patriavium was considered in the Roman times as one of the oldest towns of Italy, and there was a tradition of its having been founded by Tullus Hostilius, the second king of Rome. It was long in alliance with Rome, and had its own magistrates. At the fall of the Roman empire, it was destroyed by Attila, and the inhabitants removed to the islands in the lagoon, where they founded Venice. Patavium was rebuilt by the Venetians, and in the thirteenth century was united to Charlemagne. It afterwards governed itself for a long time as a free municipality with its consuls and podestàs. In the thirteenth century Ezzelino da Romano usurped the sovereignty of Padua, but was finally put down by his death. That of Padua, and the adjacent provinces, soon became independent, and raised their freedom, but extended their authority over several adjacent provinces. Soon after the Carrara became lords of Padua, until 1406, when Venice took it by force and united it to its territory, and caused its last lord Francesco Carrara and his two sons to be strangled in prison. Numerous writers have written on the history and monuments of Padova: among the rest, Scardeonius, "De Antiquitate Urbis Patavii et clara Civibus Patavini," fol., 1560; Genari, "Annali della Città di Padova," 3 vols. 4to., 1804; Moschini, "Il Padova, from the air by Cazzaniga," 1851; Federici, "Dissertazione storica della Biblioteca di Santa Giustina in Padova," 1815.

PADOVANO. [VARAPARKI]

PADRES. [SUMATRA]

PADSTOW. [CORNWALL]

PADUA. [PADUA]

PADUANO, FRANCESCO, was born in the year 1552. The name of the master under whom he studied seems not to be known. Judging by his works, he must have acquired his knowledge of the art in a good school. He was an artist of eminent talents. His historical pictures prove his abilities and taste. His invention was fertile and correct; his forms and muscles were designed by the Madonnai dei Carmini at Venice there was (and perhaps still is, but we cannot positively say) a picture by this master representing the deliverance of two persons con-
demmed to death, by the interposition of a saint. It is a beautiful performance: the colouring is good, the figures elegant, and the pencilling remarkably tender and delicate. As a painter of portraits he was equal to the greatest masters in that branch of the art. There was such dignity, expression, and beautiful colouring in them, as to gain universal admiration. His portraits of the Earl and Countess of Arundel are spoken of as delicate productions of this kind. He died at the age of sixty-five, leaving a son, Octavio, who studied first under his father, and afterwards for several years at Rome. He painted in the same style as his father, but was inferior to him in invention. His chief excellence was as a portrait painter. He died at the age of fifty-two, but he left many portraits.

PÆN (παῖν, παινώ, Ionic πἀνω), a hymn which was originally sung in honour of Apollo, obtained its name from that of the god to whose honour it was sung. In Homer, Pænus is mentioned as a river in Hampshire; and Pænus or Pænustus is a name of the Gauls in the south of France, and of the inhabitants of that country. A physician of Olympia (II., v. 401, 899; compare Pind., Pyth., iv. 481); but there appear sufficient reasons for supposing that this god is the same as Apollo. The pænus was sung at all the solemn festivals of Apollo, as for instance at the festival of the Heraeans at Argos, where a pænus of forty voices was sung by Scholast in Thydidae (quoted by Sturt, Lex. Xenoph., vol. iii., p. 384) says, that the pænus which was sung before a battle was sacred to Ares, and the one sung after Apollo; but whether this be the case or not, it is certain that it was sung in all the important religious festivals of Apollo. Xenophon, for instance, relates that the Lacedæmonians on one occasion, after an earthquake, sang a pænus to Poseidon (Hell., iv. 7, s. 4), and also that the Greek army in Asia sung a pænus to Zeus (Anab., ii. 2, 9). It was sung at the funerals of the dead, and in a hundred voices in the temple of Apollo. Xenophon, in fact, relates that the Lacedæmonians on one occasion, after an earthquake, sang a pænus to Poseidon (Hell., iv. 7, s. 4), and also that the Greek army in Asia sung a pænus to Zeus (Anab., ii. 2, 9).

PÆNOI, the term used by modern theological writers, not as the designation of any particular body of Christians, but for the sake of distinguishing all those, of whatever sect, who profane the sacrament of baptism from the Jews, who are called Baptistas. [BAPTISTS.]

PÆONIA. [Mackdonia.]

PÆO'NIA is a genus chiefly of European and Asiatic plants, belonging to the natural order Ranunculaceæ, and very little known in gardens. They are large and decorative, and have large gaudy flowers. They are characterized in their order by a permanent leafy calyx of 5 unequal sepals, 5 petals, stamens whose anthers split open by two fissures along their face, a fleshy elevated disk, and from 2 to 5 many-seeded ovaries. The fruit consists of leathery follicles, splitting on one side, and exposing to view a number of round, black, shining seeds adhering to a crimson placenta.

One species, P. Moutan, a native of China, is a shrub, of which several varieties, with beautiful whitish flowers stained with pink, are now in our gardens. Of these the most showy is that called P. papaveracea, which has a broad crimson stain at the base of each petal. If grown on the margin of a stream or in a moist place, it may be grown for its beautiful flowers, which are frequently used in borders. P. Brownii and Californica are remarkable for being the only species of the genus which are indigenous in America; they are natives of California and of the country to the northward, and have little beauty: the first exists in our gardens, but is extremely rare. The rest of the genus consists entirely of European and Asiatic plants, which, according to De Candolle, form fifteen species; but there can be no doubt that the greater part of these supposed species are mere varieties, chiefly of P. officinale, albiflora, tenaxfolia, and peregrina.

These plants are liable to produce double flowers, which, by the conversion of their numerous stamens into petals, are generally extremely beautiful: they have how-
the Tyrrenhian Pelasgi, and the peculiarly massive con-
struction of the walls seems to correspond with the character of the other structures attributed to that people. Medals with Etruscan characters have been found at Pæstum, in which the town is called Piastia, Pys whei, and also Sustius. (Liv. iv. 45.) This is that the Piastia to which Arrian refers; the name of the city having become unhomely and infested by outlaws, strangers did not venture into it. When Don Carlos Bourbon, having conquered Naples towards the middle of the last century, became the resident sovereign, he extinguished the town, and other remains in that solitary region, and took drawings of them, with the intention of having them published; but king Charles having removed to Madrid, Gaeta followed him thither. Mazochei, in 1754, in his work on the Herodotus, inserted a dia-
sertion that the monuments at Pæstum could not be referred to any of the architectural orders of Vitruvius; but he does not appear to be aware what they really are.

These structures, now almost the sole evidence of the opulence of Poseidonia or Pæstum, are three in number, viz., the great temple, the amphitheatre, and the theatre.

According to Paoli, the architecture of the Pæstum temples is to be considered rather as Etruscan than Grecian; yet whatever may be the country of the c·chitects, there is no doubt that the workmanship has been consummated to a high degree of perfection. There is a strong probability, that they are ascribed to the Doric style; their distinct character in that respect rendering their peculiarities all the more striking. We find here precisely the same features and members, only with a difference; and moreover precisely the same disposition. In fact it is only for the differences of the kind alluded to that these temples are at all remarkable; since in their plans and all other particulars they present nothing more than what is common to nearly all Greek temples, namely, a cela surrounded by external colonnades, or peripteral.
Both those at Perinthos are peripteral and hexastyle, the only difference between them being that the larger one has fourteen columns on each of its sides (reckoning again those at the angles), and the other only ten. The first (which is 195 feet long by 79 wide) is hypaethral, or open to the sky; that is, its cells forms an inner court, with a range of seven Doric columns on each side supporting an architrave, on which stands a second range of smaller columns of the same order, converting the monument into a temple with effect. The floor of this cellis raised several feet higher than that of the external colonnades. The external columns are of extraordinary massiveness, being seven feet in diameter at their base, though only 29'0 high; and as their upper part is divided into two distinct columns, their shafts decrease very suddenly; one, though not the most unfortunate consequence of which is, that, as compared with the necking of the column, the capital and abacus spread out excessively. Another singularity is that the architrave does not at all overhang the upper part of the columns, its soft being of the same thickness as the top of their shafts beneath their capitals; whereas in nearly all examples of the Grecian Doric the face of the architrave is in a plane parallel to the surface of the column near its base.* In comparison with the height of the columns, the entablature is exceeding deep and ponderous, being equal to one half of that of their shafts exclusive of the capital; which unusual massiveness of the upper part is in keeping with that of the lower. The smaller temple, sometimes called that of Ceres, as the other is that of Neptune, measures 107 by 47 feet, and, as has been observed, is hexastyle peripteral; though it so far perfectly resembles the one just described, it has one very remarkable peculiarity in its plan. The plan is not formed by columns between antae, and consequently enclosed at its sides, but has two columns and a half column on each side, which latter is attached, instead of an anta, to the end of the wall of the cellae. These columns are raised upon a socle of the same kind as that of the other temple, but not all basalt, and certainly regarded as the external ordure, one very remarkable peculiarity in the detail of the columns is, that for the usual narrow channels and annulets forming the hypotrichewall, or necking below the capital, a very slight cavetto, or hollow, is substituted, which is a feature of several other Greek temples. The omission of this has been generally considered as leaves, and some have most fancifully suggested that we here find the first rudiments of foliage for the decoration of capitals; whereas, to say nothing of the utter dissimilarity between such ornament and foliage properly so termed, it consists of what look more like husks than any kind of leaves.

Besides these there is a third building, which has greatly puzzled antiquaries on account of its having an odd number of columns; one column on each side from the entrance, which led them to suppose that it could not have been erected for a temple, but must have been a basilica, palestra, or other public building. Except however as regards what, owing to there being no remains of pediment to call attention to the central column, does not at all strike the eye, there is nothing whatever in the character of the design to distinguish it from the generality of Greek temples, it being merely a peripteral building (whose dimensions are 177 feet by 75) with nine columns at each end and eighteen on each of its longer sides, those at the angles of the former being reckoned again. The only thing at all remarkable now to be traced in its plan is that it was divided in its breadth by an internal range of columns in the middle, those on either side remaining part conjectures it to have been a double temple, with a single cell divided by a mere screen of columns, and dedicated to the Dioskuris, as the tutelary deities of navigation and the protectors of the port of Perinthos; or rather, according to his restoration the Pallas of the temple of the Athenians, it was merely a very deep pronoas, having three columns in antis in front, and a range of four columns within, forming a double avenue leading to two smaller sanctuaries containing the altars or statues of the respective divinities. Yet as no internal walls now exist, it has been conjectured that there never was any kind of cella or enclosure within the external colonnades.

The order itself is very remarkable, for besides the neckings of the columns being ornamented somewhat similarly to those of the smaller temple, the shafts are very much curved, so as to seem almost to belly out in their middle, owing to their diminishing in size suddenly to two-thirds of their height, while the contraction just at the necking causes the abacus to appear of extraordinary magnitude, its breadth being in fact considerably more than double the upper diameter of the shaft, whereas in Athenian examples, the breadth of the abacus is only one half more than the upper diameter.

In order to show at one view both the actual dimensions and proportions of the columns, we give them in feet and inches, without regard to fractional parts of the latter; and as their height is little affected by the plan, we have reduced them to a common scale, which most nearly approaches to them in massiveness, that also is added. At the same time we are enabled to make a mistake in the table of Doric examples at page 387 of Column, where the lower diameter is stated to be only 3 feet 2½ inches, and the upper 4 feet 4½ inches.

<table>
<thead>
<tr>
<th>Height of column</th>
<th>including capital</th>
<th>Lower diameter</th>
<th>Upper diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great temple at Perinthos</td>
<td>25'0 4'</td>
<td>4'1</td>
<td>4'1</td>
</tr>
<tr>
<td>Smaller temple ditto</td>
<td>20'0 4'</td>
<td>3'5</td>
<td>3'5</td>
</tr>
<tr>
<td>Third temple, or basilica</td>
<td>20'0 4'</td>
<td>3'5</td>
<td>3'5</td>
</tr>
<tr>
<td>Temple at Corinth</td>
<td>23'8 5'4</td>
<td>4'0</td>
<td>4'0</td>
</tr>
</tbody>
</table>

PAEZ, PEDRO, a celebrated Jesuit missionary, was born at Olmedo, a town in New Castile, in 1564. Having completed his studies at the college of his order, he was appointed to form part of the mission to Goa, and sailed for that port in 1587. At that time the numerous Portuguese there had just been defeated by the Princess Catharine of Toledo de Gama, being without a patriarch or spiritual director of any sort (Abyssinians), sent to Goa for some priests, when Paes and another Jesuit, named Antonio dos Pintos, were despatched on that mission. The two missionaries sailed from Goa in 1588, and landed at Diu, where they made some stay, disguised as Armenian. They then sailed for Muscat, on the 5th of April, 1588. From thence they made for the port of Zanzibar, and remained there some time. Their passage was purchased by an Arab pirate, in sight of Dofar (14th Feb, 1589), and carried in irons to the capital of the king of Shael (Xaaer in the Portuguese writers). They were at first kindly treated by this sovereign; but he himself being a tributary to the Turkish pasha of Yemen, and bound by treaty to send him all the Portuguese who might fall into his hands, Paes and his companion were sent to Sanaa, the capital of Yemen, and the court of the pasha, where they passed seven years in the most dreadful captivity. Being at last released by the king of Persia, they were introduced to the king of Tyr, the sovereign of Syria, and the senate of that city, and permitted liberty upon the payment of a thousand crowns ransom for each, the two missionaries returned to Goa in 1596. The ardour of Paes seems not to have been damped by his past sufferings; on the contrary, after spending several years at Diu and Cambaya, he was again sent by the king of Syria to some other part of the Turanian empire, where he landed at Musaw in April, 1603. His first object was to learn one of the most extensively used native dialects, the Gheez, in which he soon acquired such a proficiency as to be enabled to translate into it the compendium of the Christian doctrine written by Marcos George, and to instruct some native children in the dialogues which that work contains. In 1604, Za-Dengheyl, the reigning monarch of Abyssinia, hearing of the attainments of Paes and the proficiencies of his pupils, sent for him to come over to his court with one of them, that he might judge for himself. Paes was kindly received by the king, who conferred upon him all sorts of honours and distinctions. On the following day a feast was maintained in his royal presence, when Paes's pupils were present, and he was entertained in the most sumptuous manner. The king was next conducted to the great temple of Ezana, which was next conducted to the great temple of Ezana, whereafter Paes preached a sermon in Gheez with so much success, that the king himself became a convert to the new religion, and wrote to the pope, and to Philip III., then on the throne of Spain, praying them to send him a reinforcement of missionaries. This wish of the monarch, having been made public, proved fatal to him; for the Abyssinian priests, dreading the ascendancy which Paes and his pupils had assumed at court, excited a rebellion, and Za-Dengheyl was killed in a battle with his rebel subjects, on the confines of the province of Gojam (Oct. 1604). Socinians, otherwise called Meliek-Seghed, who sus-
ceased Za-Denghel in the empire, was still more favourable to the views of the Portuguese missionary. Soon after his accession to the throne, he summoned to his presence Paez, who had celebrated mass and preached before all his court, and assembled for that purpose a large piece of ground at Gorgora, on a rocky peninsula on the south side of the lake Dembea, to build a monastery for his order and a palace for himself. On this occasion, which was celebrated with great solemnity by any European, but with the mere help of the natives working to Paez a treated Davidon, a building which was the astonishment of those who beheld it. A spring-lock, which he fixed upon one of the doors, saved the king's life when an attempt was afterwards made to depose him. He also went in great respect to Soconis, whom he accompanied in all his military expeditions.

It was on one of these occasions that he visited Magdina, a town three days' march from the sources of the Nile, and surveyed the neighbouring country, a fact which Bruce relates, and which gives to the king's person a venerable seemliness, and persuading the king to receive the general confession, and repudiate all his wives but one. Catholicism, thus introduced into Abyssinia, did not long remain the religion of the state. After the death of Soconis (1632), his sons murdered their red and black mother, and published the old creed, which was Christianity, though in a corrupt form. Besides the translation of the Catechism written by Marcos George and other tracts into the native dialect of Abyssinia, Nicolas Antonio (Dib. Nov., vol. 2, p. 231) says that the Medetranian, Maronite, and Coptic, and five European species of Pagellus are known. Two species occur on our own coast: the Spanish Bream (Pagellus erythrinus, Cuv. et Val.), which is of a fine coloration, and the other, Pagellus centrodontus (Cuv. et Val.), which is also known by the names of the Gilt-head and Red Gilt-head. The former of these two species is very common in the Mediterranean, and the latter is abundant in the Red Sea. Mr. Yarrell states that he has never seen above two or three specimens, and these were taken with the Sea-Bream, which is also common in the Mediterranean, and by no means uncommon on our own coast.

The following description of the Sea-Bream given by the author of the 'History of British Fishes.' The jaws are short, and equal in length; the eye is very large, iridescent golden yellow; the head short; the line of the profile descends rapidly; cheeks, operculum, and interoperculum covered with scales used in combing wool, a character which appears before and under the orbit have a metallic tin-foil appearance; two broad stripes are observable on each side behind the head, and these meet on the central line at the top; at the origin of the dorsal line, behind the edge of the operculum, is a conspicuous spot. The dorsal fins are yellow and the colour of the body is reddish, tinged with grey; lighter on the sides, which are golden grey, and marked with faint longitudinal bands, which extend the whole length of the back; the belly is very white, and the anal and dorsal fins are brown, each appearing as if lodged in the flesh. The pectoral fins and tail are red, and the ventrals are grey.

The Sea-Bream is not highly esteemed for the table. It is found most abundantly in the Mediterranean, containing the principal. It appears that the coast in the cold weather. Mr. Yarrell moreover states that the spawn is shed in the beginning of winter in deep water; and in January the young fish, which are called Chaps, of about one inch in length, are found in the stomachs of large fishes taken two or three leagues from land: in summer, when from four to six inches long, they abound in innumerable multitudes, and are taken by anglers in harbours, and from the rocks; for they bite with great eagerness at any bait, even of the flesh of their own species. They are often found and admired in fly-fishing, especially confined to animal substance, for they devour the green species of sea-weeds, which they bite from the rocks, and for bruising which their molar teeth are well suited, as are their long and capacious intestines for digesting them.

The Sea-Bream is thus related because it is commoner in the British seas than the commoner British species, the eyes are smaller, and the mouth has a wider gape. The colouring is also different; it has not the dark patch which is observable on each side of the body near the head in the Sea-Bream. Some of the Chinese pagodas, or rather the

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counts enclosing them, are of very great extent, as for instance that of Ho-nang in the south suburb of Cusan. The interior area of which is an oblong of 590 by 220 feet, surrounded by cells for the Bonzes, in the centre of which quadrangle are three pagodas or pavilions, each 33 feet square, elevated upon a terrace, and consisting of a numbering the lowest surrounded by a periphery of twenty-four columns. Some of the Chinese temples are lofty towers in several stories, diminishing in height and width as they ascend, each having a projecting roof of glazed tiles, and generally with bell-towers. The pagodas of the buildings erected in Kew Gardens by Sir W. Chambers is a lofty Chinese pagoda of this kind; yet although called pagodas by Europeans, the name given by the Chinese themselves to such towers is Tous. There is a very celebrated Teo at Nankin, composed of porcelain, so that, like most others, an octagon, upwards of 210 feet high, and divided into ten stories, each of which has a marble gallery with gilt lattices, the stairs being formed within the thickness of the walls. The summit is surmounted by a cupola, from which rises a lofty pole or mast, containing the bell, and there also, Tchang-Fou, the exterior is also of porcelain, but the walls themselves are of marble. Others have a single staircase in the centre carried up through all the different stories. Although so completely dissimilar in style, these Tea are built in imitation of the Buddhist or the ten-story pyramid temple-towers, of the Hindus. [HINDO AS- CRITURCTS.] Both seem to have originated in a common idea, differently modified, according to the taste and mode of construction of their respective nations.

PAGURIANS. The side of the cephalic section of the Anmonuran family of crustaceans, composed of a considerable number of species, the greater part of which are remarkable for the more or less complete softness of the abdomen, the want of distinctiveness of the appendages of this part of the body, the shortness of the second pair of walking legs, and many other characters. In the greater number, the abdomen is small, nearly entirely membranous, and partially rolled upon itself; and for the protection of this defenceless part of the body, the furcula, usually, and generally, some gastropod. The crab is retained in the shell by the aid of the posterior feet, and a pair of crustaceous appendages at the end of the abdomen. In some species it is further fixed by means of certain organs on the lower side of the abdomen, which are attached closely to the cartilaginous regions, and the two lateral portions form the branchial regions, which last are separated by a similar line from the lateral parts of the carapace, which descend towards the back, with a slight indentation above by a rostriform prolongation of the carapace, but is always free, and has above two small prolongations in the form of scales; the ocular peduncles, which are directed forwards, are not retractile, and are inserted directly above the eyes, on each side of which are two other appendages, but always have the basilar joint either small or elongated, and are fixed by two short or moderate articulare filaments. The external antennæ are inserted on the outside of the internal ones, on the sides of the ocular peduncles, and the second joint of each is a large piece, which is ordinarily moveable, and seems to be analogous to the palp. The external jaw-feet are pediform. The sternum is nearly linear forwards, and is a little enlarged posteriorly; the two last rings of the thorax are entirely free, and the antennæ, or grasping organs, are on the carapace, and is completed above by a tergal horn-piece. The anterior feet are large, and nearly always of unequal dimensions; they are terminated by a large manum, the claws of which are short and very stout. The two succeeding pairs are very large; the fourth pair, on the contrary, are short, elevated above the others, and nearly always terminated by a denticulate hand; the fifth pair are equally short, elevated on the sides of the body, and terminated by a more or less well-formed pincer. The first five pairs of the abdomen are furnished with greater or less size, the first of which ordinarily is nearly confluent with the last thoracic ring; sometimes this first abdominal segment is in both sexes furnished with a pair of rudimentary appendages applied against the base of the posterior feet (but regionally it is otherwise), in the female the second also is sometimes furnished with a pair of false feet, but in general only gives insertion to an appendage placed on the left side; the three succeeding segments are always deprived of appendages on the right side, and only sometimes on the left side. Ordinarily they each support a false foot composed of a basilar cylindrical stem and one or two terminal blades; these appendages, which are consequently four in number, generally, are only very small in the male and rather larger in the female. The second pair is placed on the posterior part of the second abdominal segment, and the third pair on the posterior part of the third abdominal segment.

Mr. Broderip, in a paper 'On the Habits and Structure of Pagurus,' Zool. Joum. iv. 5., states, that in pursuing his inquiries upon that subject he had been struck with two facts upon the economical and social habits of these crustaceans. Their backs are towards the arch of the turns and the face of the occupant by them, and their well-armed nippers and first pair of succeeding feet generally project beyond the mouth of it. The short feet rest upon the polished surface of the columnella, and the outer surfaces of their termination, especially that of the first pair, is in some species most admirably roughed, to give 'the Soldier' a firm footing when he makes his sortie, or to add to the resistance of the crustaceous holder at the end of his abdomen or tail, when he is attacked and wrested away. The first pair of walking legs, directed towards the rear, line downwards over the termination of these feet, they feel smooth; but if the finger be passed upwards, the roughness is instantly perceived. The same sort of structure (it is as rough as a file) is to be seen in the smaller caudal holders. The second pair is observed in a very fine larges species of Pagurus from the Mauritius (Pagurus guttulatus of Olivier, he is inclined to believe). Two specimens (now in the British Museum) were in his possession, one of which was housed in a very large young shell of Pieroceras truncatissum, the other in a young plumose shell. The carapace of the under side of the abdomen or tail of this specimen, a great number of transverse rows of acetabula were to be seen, even without the aid of a glass. Dr. Bright has another naked specimen, in which the same formation, which may prove to be a link between two sides of the same family. Respiratory System.—MM. Audouin and Milne Edwards, in their interesting memoir, 'De la Respiration appele Crustacés,' give the following account: 'An apparatus of the appendages, and modifications that the branchial branch, which run through the crustacean and terrestrial, show, that in all the crustaceans the branchiæ are fixed on the edges of the branchial processes. The respiratory function of these appendages is the function of the branchiæ of the crustacea, and the functions of respiratory organs in the air as well as in the water, and that one of the conditions necessary to the life of animals which have branchiæ and live in the air, is the possessing organs defended against desiccation. The following is the necessary form which these branchiæ of the crustacea will be found in the article GECARCINUS; and the habits of some of the Pagurians demand such a proviso, as we shall presently see.'

In the museum of the Royal College of Surgeons (Physiological Series, No. 983), D.'s is a preparation of a Hermat- Crab (Pagurus Streblostronx, Leach), with the branchiæ inserted and exposed on both sides. No. 993 of the same series is a small crab (Cancer Pagurus, Leach), with the branchiæ exposed and mounted. No. 992 is a small crab, the second joint of the branchiæ being cut off and mounted. These are crossed and, as it were, bound together, by a narrow flattened process, which extends from the anterior part of the branchial cavity. (Cat.)

Digestive System.—No. 612 of the Physiological Series is a preparation of a crab, the branchiæ being cut off and mounted. The fore part of the branchiæ is a minute crab (Pagurus punctulatus, O.1.). Opened on the ventral aspect to expose its intestinal canal. Its structure and disposition are as simple as that of the Scorpion (Eustus Aferreus), which immediately precedes it. The canal
grows gradually to its termination, which is just below the last crustaceous appendage of the tail. (Cat.)

Brain and Nervous System.—In the museum of the Royal College of Surgeons, in London (Physiological Series) with other objects, that the inhabitants eat it, finding it very good, though it does not appear to be liked by strangers. This account appears to have been taken from Du Terrere's 'Voyage.'

Sloane thus describes the 'Soldier:'—'This small lobster or crab differs in very little from the European soldier or hermit-crab. It has two large forked claws like those of an ordinary lobster, one of which is carried on the back, the other on the bottom, both round, more timid, less prickly, and of a paler red than that of Europe, &c. They fit themselves with any shell they find empty, whether it be of the land or sea, and cover themselves almost entirely in it, carrying it on their backs wherever they go, like a small sail. It is not improbable to believe how quick the land-crabs and this crab will run upon the least appearance of danger. They are turned up, nothing appears but a dead shell, the mouth of which is often undermost, the little part of the crab appears after it is taken up.' (Jamieson.) Sloane figures two of these animals (apparently Cenobita Diogenes) in land-shells (Helice), and we saw an individual of the last-named species alive in the shell of a Helice at the Garden of the Zoological Society, which was converted into claspers, enabling the animal to adhere to the columnella of the univalve shell which it may have selected to protect that part of the body which nature has left undefined by a crustaceous covering. (Cat., vol. iii., part 1.)

Senses.—The above paragraph will show the extent to which sight, touch, and taste are developed; and in the same series of the same museum (No. 1559, A) is a Hermit-Crab (Pagurus Miles, Olivi) prepared by the skilful hands of Mr. Oppian, Aelian, and Galen. Pliny seems to confound these with the Pinnotheres or Pinnophylax, as is noticed by Aldrovandi, Ray, Rumphius, and others; the latter very particularly. Jonston's account is little beyond a compilation from the authors above named. Charlevoix ('History of Hispaniola'), says, 'that kind which is called a soldier (soldat) is, as well as the crabs, a species of shellfish, but is more recommended in that shell.' It therefore comes the cellus Marinus. It is found all along the sea, and is good to eat. It has its name from being armed all over the body, except at the lower extremity, where it is naked, and where it seems to have possessed a spratly body; it is then covered with the shell in this first shell it meets with; but to dissolve it, is only necessary to place it near the fire.'

None of the writers here quoted appear to speak of these soldiers as being terrestrial, and the old authors have given any account of them will be mentioned in the next paragraph, which treats of their habits, &c.

Habits, Food, Reproduction, &c.—Labat mentions 'the soldiers' among the animals that descend every year to the sea, to deposit their eggs under their skin or their shell. The old French Encyclopædia defines Bernard l'Herminier to be cancellus, an animal of the crustaceous genus also called Soldier. After a very particular description, the account proceeds thus:—'There are in the Isles of America Hermit-Crabs, which were from 4 to 6 inches in length. They relate that this animal comes once a year to the edge of the sea, to lay its eggs and change the shell; for it is obliged to quit the shell in which it is lodged, because, having increased in size during the year, it finds its shell too small and cannot move it. It therefore comes to the shore and seeks a new shell which may be convenient for it. As soon as it meets with one, it comes out of the old one and tries the new lodging, and, if that suits, it remains there; but it is often obliged to enter many shells before it finds one proportioned to it. If it happens that two hermit-crabs stop before the same shell, a dispute arises, and the weakest yields to the strongest. The same author states, that it pinches hard and does not let go its hold easily, so that the inhabitants eat it, finding it very good, though it does not appear to be liked by strangers. This account appears to have been taken from Du Terrere's 'Voyage.'

Catesby, who figures a Cenobita Diogenes in the shell of Turbo Pica, says, 'They crawl very fast with their shell on their back;' and at the approach of danger draw themselves within the shell; and thrusting out the larger claw in which very hard spines are placed on it. They frequent most those parts of the sea-shores which are covered with trees and shrubs producing various wild fruits on which they subsist; though I have seen them feed on the fragments of fish and other animal substances which have passed over the shore. They are not necessarily tied to any one species but are satisfied with the shell is esteemed delicate. I do not remember to have seen any of them go into the sea.' (Carolina.)

Browne notices 'the Soldier' and 'the Common Soldier,' and states that the latter is very common in all the harbours of Jamaica. Linnaeus says of the Diogenes that it inhabits the Asiatic and American Ocean in various shells of Cochleae. (Cuvier, after mentioning univalve shells as the usual covering of the genus Pagurus (Fabric.), remarks that some species lodge themselves in Serpula, Agelaea. Others have seen individuals lodged in Aleoconia. Cuvier also observes that it would even seem that some of the Paguri are terrestrial. Not to detract the reader with those authors whose labours have been principally confined to classification, such as Herbst, Fabricius, Olivier, Latreille, Leach, Duméril, Brisson, Bosc, Rius, and others, we call his attention to the observations of M. Desmarest, who says that these crabs are ordinarly met with on the shallows of flat sea shores (piages) by people who pass within reach of the crabs and are able to seize. Naturalists, he adds, make mention of many species of Paguri that live on land at a considerable distance from the shore and lodge themselves in holes, and he thinks it probable that such ought to enter into the genus Perumonius. (Connaissances gnerales sur la classe des Crustactes.)

But whatever may have been the form of the terrestrial Paguri above alluded to as lodging in holes, the specimens sent to Mr. Broderip by Mr. De la Beche, and forming part of the interesting series of crustaceans which were true hermit-crabs of two species, one Pagurus (Cenobita) Diogenes, and the other somewhat resembling Pagurus Pideau (Leach). Of the first, there were forty-two of various sizes, and they were housed in the following marine shells: two in Fuscatoria Tupilus, and twenty-nine in Pyrula Melongena. Of the latter species of Pagurus (the 'Common Soldier' of Browne) there were ten. It is now known that in Fuscatoria Tupilus, and nine in Pyrula Melongena. The shells chosen by these last were large in proportion to the bulk of the inhabitant, so large indeed, that some of the Paguri were scarcely visible. The following is extract
from Mr. Dr. la Beche's letter to Mr. Broderip, dated 1st August, 1828:—

When I was in Jamaica, about three years since, some of the persons on my estate at Halse Hall brought me specimens of Paguri, which they said they had obtained from a savannah, distant about a quarter of a mile from the house. This savannah is a plain formed of what I have elsewhere termed savannah sandstone and conglomerate. It is very dry and covered for the most part with log-wood, green oak, lignum vitae, the cypress, and various shrubs and trees with patches of grass and other plants. After heavy rains the surface of the ground is nearly covered with herbage; but, after dry weather, a considerable portion of the soil is exposed. The savannah, which is of great extent (over four miles long at least, two thousand acres), is thirty feet above the Rio Minho, which runs round the border of it, and about two hundred feet above the level of the sea, from which it is distant at least ten miles. The tide only penetrates just within the mouth of the river, and rises there above the place where the height of the ridge is convex and that there is not even brackish water at a nearer point than ten miles. When the Paguri were brought to me, they were alive, and I observed they were housed in marine shells, and at first thought they must have been brought from the sea voyage; but I visited the place, and I found that these rudiments under the name of 'soldiers,' were frequently taken alive for food in the savannah, to which I immediately proceeded. On its northern side and at its junction with the hill that rises above it, I found the little hollows of the white limestone several of these Paguri, in marine shells, and in full health and activity. I afterwards learnt that they were by no means uncommon in such situations all over the island. When I saw them, there had been a good deal of wet weather. They were in moist places, but there were no pools of water.

Another gentleman, who resided some time in the West Indies, informed Mr. Broderip that he had seen the first mentioned species (Diogenes) about his house, when he lived at Port Henderson, and that he had also observed them about houses at Spanish Town, a place about six miles distant from the sea. Mr. Broderip was also informed that Westmoreland swarmed with them. (Zool. Journ.)

Place in the System, and Classification.—M. Milne Edwards, who places the Pagurians in the same family immediately after the Hippops and at the end of the brachyurous crustaceans, divides the tribe into the genera Pagurus, Cancellus, Cenobites, and Birgus.

Pagurus. (Fabricius.)

A great resemblance exists among all the Paguri, properly so called, not only in the details of their organization, but in their habits. The cephalo-thoracic portion of their body is shorter than the abdominal portion. The carapace is nearly as large before as it is behind, and is but little or not at all prolonged laterally above the base of the eyes; posteriorly it is strongly notched in the middle, and anteriorly it is either truncated or armed with a single rudimentary rostrum. The basilar portion of the ocular peduncles is exposed. The internal antennae are placed directly under the eyes. The external antennae are inserted on the same line as the ocular peduncles, and have, above, a stout movable spine which represents the palp; the joint of their peduncle is slender and cylindrical, and is fixed by a membrane which is very long. The external jaw-feet are moderate in size, their stem is pediform, and their palp very much developed. The anterior feet are in general very unequal, and one of the hands very convex. The fourth pair of feet are very slender, the penultimate pair is furnished with a somewhat oval and whitish plate, in general very large, and prolonged above the next joint, so as to constitute with it a didactylous pincer. The fifth pair are longer, more slender, more recurved upwards, prevent also the end of a granular plate, and are terminated by a more or less well-formed didactylous pincer. The abdomen is of considerable size and membranous, the plates of its dorsal surface are nearly symmetrical, but very delicate, and distant from each other. Sometimes there is at the base of the abdomen of the female a pair of rudimentary false feet, and two pairs of appendages more developed in the male; but in general the first segment is without any, and the second, as well as the three succeeding segments, has a single one placed on the left side, and fixed to the border of the dorsal plate. These appendages are always small, and terminated by one, two, or even three ciliated lamellae upon their edges, which, in the female, are of considerable dimensions, and serve for the insertion of the eggs. The appendages of the penultimate ring of the abdomen are each composed of a basilar joint, which is short and stout, supporting two other short and hooked pieces, one of which is inserted at its inferior border, the other at its extremity, and each furnished with a very small plate similar to that on the posterior feet. These two false caudal feet have not exactly the same form, and are of very unequal size, that of the right side being much smaller than the other. (M. E.)

The species are numerous, and are divided by M. Milne Edwards into the following sections.

Species whose ophthalmic ring is not armed with a median rostriform piece.

A. Ocular peduncles large, and shorter than the basilar portion of the external antennae.

a. Spiniform palp of the external antennae going beyond the extremity of the ocular peduncles.

In this section there are three species. We select the Common Hermit-Crab, Pagurus Bernardus, as an example.

Pagurus Bernardus.

1. out of the shell; 2, right jaw-foot; 3, in the shell.

Description.—Anterior border of the carapace rather deeply notched above the base of the ocular peduncles, and presenting on the median line a projecting angle which has the semblance of a small obtuse rostrum. Ocular peduncles stout, short, of the same length as the portion of the front which covers their base, and swollen, as it were, at the end. A wide space between the two basilar joints of these peduncles, which are armed with a large tooth, flattened and nearly oval, or rather lanceolate. Third joint of the internal antennae, scarcely reaching beyond the basilar portion of the external antennae, the second joint of which is armed at its external angle with a very sharp tooth, and the third one on the middle of its upper border the spiniform palp, which is very long (at least as long as the terminal joint of the ocular peduncles), slender from its base, and recurved below, then forwards, a little in the form of the letter S. Anterior feet stout, and rough with isolated, unequal, and more or less spiniform tubercles: the right much stouter than the left; carpus nearly as long as the palmary portion of the hand, which is convex above; the pinchers stout, very short, and without a distinct terminal nail. Second.
last joint very stout, compressed, twisted on itself and enlarged a little towards its extremity, which afterwards is rapidly narrowed to a point. Third pair separated at their base by a small selenial plate, which is nearly square. Hands of the posterior feet very short, and terminated by a very flat and extremely short pinion. Abdomen with lateral plates only in its membranous part. In the female, four false oviferous feet, formed by a cylindrical and elongated joint, and two lamellar terminal branches. Fourth false foot much smaller than the others, and its external branch rudimentary. In the male, three false feet, composed equally of a cylindrical joint, and of two terminal pinions, one of which is lamellar and rather large; the other rudimentary; no similar appendages on the right; a semilunar notch at the posterior border of the terminal lamina of the abdomen. Ordinary length about 5 inches, sometimes more.

Locality.—Coasts of England, France, and of Northern Europe as far as Iceland.

a. a. Spiriform palp of the external antenna exceeded by the ocular peduncles.

Example, Pagurus striatus. The anterior feet of this species are very large, especially that of the right side, they are covered nearly throughout with transverse lines, which are curved, tubercular, and furnished with small rather thick-set hairs on the upper part of the member; many of these tubercles of these feet, in the male, acquire sufficiently large dimensions to become large pointed spines. Colour red mixed with yellow. Length from 7 to rather more than 8 inches.

Locality.—Mediterranean sea.

b. Ocular peduncles reaching beyond the basiliary portion of the external antenna.

b. No rostriform prolongation on the anterior border of the carapace.

Example, Pagurus deformis.

c. c. Abdomen, with one or two pairs of appendages under its base.

Example, Pagurus maculosus. Rostriform tooth delicate and elongated. Ocular peduncles rather narrowed towards the middle, longer than the anterior border of the carapace, and reaching a little beyond the basiliary portion of the internal antenna. External antennae of moderate length. Anterior feet short, thick, and finely granulated; manubrium convex at its base, but becoming nearly triangular towards the upper part, furnished above with a small spinous crest, and having a second crest on its lower border; fingers stout, triangular, pointed, and touching each other on a straight edge; two succeeding feet very much compressed and dentilated on their upper border; their last joint nearly lamellar, falciform, and of moderate length; penultimate joint of the fourth pair not prolonging itself much above the tarsus, which is conical and moveable. Abdomen of the male with a pair of short dorsal and lamelliform appendages of its anterior and lower part; these appendages are applied against the genital orificees, and are succeeded by a second pair equally symmetrical, but slender and diliform; three false feet, terminated by a simple lamella, are fixed on the left side near its limb; abdomen of the female with one pair of false rudimentary feet, applied against the base of the thoracic feet of the first pair, and followed by four oviparous appendages, the three first of which, fixed to longitudinal and narrow laminae, terminate by two lamelae, and are covered by a large latero-inferior fold of the skin of the abdomen, which constitutes a concave blade, ciliated on its edge and directed forward for the lodgement of the eggs;
the fourth filament is simple and does not appear to afford attachment to the eggs.

Locality.—The Mediterranean Sea. (M. E.)

Four other species are arranged under this subsection by M. Milne Edwards. 

§ Species having the ophthalmic ring armed above with a moveable rostriform tooth, which advances between the ocular peduncles, and is denticulated on its edges.

Example, Puguris Miles.

Description.—Ocular peduncles moderate, not reaching remarkably beyond the penultimate peduncular joint of the internal and external antenna; their basilar scales large, flat, and applied against the rostriform prolongation. Anterior feet very unequal; that of the left side very strong and entirely covered above by more or less acute spines. Succeeding feet granulous and spiny above, their tarsus very long, with a tridentate edge, furrowed externally, and armed above with spines. Abdomen of the male with four rather large false feet, terminated by a long simple lamella. Length about three inches; colour yellowish. 

Locality.—Coasts of India. (M. E.)

Two other species are arranged by M. Milne Edwards under this subsection.

Cenothis. (Later).—This genus, in the opinion of M. Milne Edwards, establishes the passage between the Puguri, properly so called, and Birgus. The abdomen is conformable with that of Puguris; the antennae resemble those of Birgus; the expanse is equally characteristic, for it is much more solid than it is found in the Puguris, is narrowed and compressed forward, and presents in its posterior half a projecting border, which separates its upper surface from the lateral portion, which descends vertically towards the foot.

Under side of expanse, &c. of Cenothis.

The ocular peduncles are rather short, but large and compressed, so as to be nearly lamellar; the cornes occupies the terminal and external portion. The internal antennae, inserted a little behind the external ones, are extremely large; their first joint, large at the base and cylindrical, reaches beyond the eyes, and has a second joint still longer; the third joint is rather longer than the second, and supports two terminal filaments, one of which is short and setiform, the other stout, rather long, and obtuse. The external antennae are very much compressed, their peduncle is long, but does not reach the extremity of the second joint of the internal antenna, and their palp is only represented by a small rudimentary tarselle. The external joint-feet are pediform, short, nearly cylindrical, and devoid of teeth towards their base. The anterior feet are stout, unequal, and terminated by a short manus, which is compressed internally. (See cut below, figure a.) The second and third pair are large, but present nothing remarkable; the fourth pair are nearly rudimentary, and their last joint has the form of a small tarselle, scarcely moveable; the fifth pair are formed as in Puguris, except in the male, where their basilar joint prolongs a little more or less extended, at the extremity of which is the generative apparatus. The abdomen is membranous and rolled upon itself, as in the Puguris, but is shorter. In the female it has, on the left side, three rather large false ovisettes fixed to the dorsal plates; further backward is a fourth horny plate without any appendage. At the extremity of the abdomen is a dorsal horny segment, with a median lamina on its posterior border, and on each side an appendage, that of the right side being much the smallest; the form of these appendages is the same as in the Puguris. In the male all these abdominal appendages, with the exception of the termina-pair, are completely wanting; but dorsal horny plates indicate the division of the abdomen into rings.

The Cenothis, which are all the inhabitants of warm climates, are thus divided by M. Milne Edwards.

§ Species having the ocular peduncles nearly cylindric, rounded on the upper border, and terminated by a hemispherical cornes which reaches beyond the prolongation of the peduncular joint received into the notch of its upper border.

Example, Cenothis Diomene.

Description.—Stomachal region hardly convex; ocular peduncles only of the length of the anterior border of the expanse, and nearly triangular; their basilar scale moderate and oval; tarsus very short; a tridentate and very projecting crest on the lower edge of the two last joints of the third left foot. Length about three inches; colour, especially of the large claw, red or violaceous.

Locality.—The Antilles. Only one other species is placed by M. Milne Edwards under this section.

Under side of expanse, &c. of Cenothis Diomene.

Cenothis Diomene.

a. Partially out of shell, showing the arrangement and structure of the antenna, expanse, feet, &c. Among these last, what may be called the sixth joint-pair (the fourth) are well displayed; b. large claw (external view). (M. E.)

c. Cenothis in shell (Turbo Pica), showing the disposition of the first pair of feet (the fifth), as being the wide-thrusting shell claw, and the large claw serving as a kind of operculum to protect the aperture.

§§. Species whose ocular peduncles are very much compressed, terminated above by a rather sharp border, and support a nearly triangular cornes, which does not sensibly reach beyond the prolongation of the peduncular joint received into the notch of its upper border.

Example, Cenothis rugosa.

Description.—Stomachal region nearly flat; labial border of the branchial regions very projecting and slightly curved. Ocular peduncles nearly twice as long as they are broad; their basilar scale moderate and pointed. Feet granulous and slightly muriated; the great claw moderate, and furnished above with a row of small, oblique, and parallel crests. Tarsi short and triangular. Upper and external...
edges of the two last joints of the third left foot elevated into an obtuse crest. Length about three inches.

Locality.—The Indian Ocean. (M.E.)

Three other species are placed by M. Milne Edwards under this section.

Cancellus. (Edwards.)

M. Milne Edwards says of this small generic division, that it is but little distant from the Paguri proper so called, and is not as yet more than imperfectly known to him, for he had not examined the female of any species, but the peculiarities offered by the organization of the male prevent him from referring the form to any genus already established. The abdomen, instead of being rolled upon itself and terminating in a sort of shapeless tail, is perfectly symmetrical; the appendages of the penultimate abdominal ring have the same form as in the Paguri, but are similar on each side, and there is no other appendage adhering to the abdomen between this segment and the thorax.

Example, Cancellus Typus. Thus, the only known species, is described by M. Milne Edwards as having the rostriform tooth, large, triangular, but projecting little. The anterior portion of the carapace convex and without perceptible furrows. Ocular peduncles slender, reaching beyond the peduncle of the external antenna for nearly one-half of their length, but nevertheless shorter than the anterior border of the carapace; cornea transparent, very small, and without any notch on its superior border. External antenna very short, hardly more than twice as long as the ocular peduncles. Anterior foot equal, and depressed above; on the upper edge of the manus a dentilated crest, which is united to a rounded longitudinal elevation on the external surface of the manus, so as to form a triangle of three faces on the carpus; external surface of the manus a little warty; plates very small. Second pair of feet much stouter and longer than the third, and furnished with a crest which extends from the middle of the third joint to their extremity, in describing a regular curve, the convexity of which is outward; the upper extremity of this crest is elevated, like that of the anterior foot, pyramidal, and corresponded exactly to the extremity of the ocular peduncles, when the feet are directed forwards. Tarsi very short and rather stout. Third pair of feet very much compressed. Basal joint of the posterior feet large and squamiform. Abdomen of the male short, large, furnished above with very narrow transverse plates, which have no appendages, and terminated by a pair of appendages as in the other Pagurians, but symmetrical, and by a median lamina equally symmetrical.

Meridional observations and an elaborate description, which ought not to be omitted. This genus appears to him to establish the passage between the Paguri (or rather the Cenobitidae) and the Lithodidae. [Homolians, vol. xii., p. 279.] Their carapace, terminated anteriorly by a horizontal and projecting rostrum, is divided into two portions, as in the Cenobites; the anterior portion formed by the first and second abdominal segments is narrow, but the posterior portion is very large and oval, the branchial regions being very much developed, and forming on each side a sort of semicircular buckler, which advances above the base of the foot. The ocular peduncles and stalk, round or oval, somewhat more slender than those of the Pagurian antennae have the same conformation as in the Cenobites, except that their basilar joint is still more elongated. The disposition of the external antennae and of the external jaw-feet is also entirely the same as in the last-named Families. The abdomen is about three times as long as the carapace, and the seventh abdominal foot, which are very short and cylindrical, are elevated under the lateral parts of the carapace, and terminated by a very obtuse rudimentary pincher. The abdomen is very large, and covered above by a small horn, followed by four great corneal-calcareous plates, which, with the whole wide and over-ride each other, as in the Mucronatus Crustacea. On each side of these great segments are to be seen one or two horny pieces, which seem to be the representation of the epimerian piece of the first four abdominal segments. The abdomen is thus divided into three segments, that is to say, the second, third, and fourth rings, have on each side a great false foot formed by a small basial piece and two great narrow and ciliated appendages; those members are wanting on the side of the female, and are only represented in the male by a few traces of their presence. The whole of the inferior surface of the abdomen is membranous, except that, towards its posterior part, may be seen a small quadrilateral plate, which gives attachment to a second projecting plate, and has on each side an abdominal rudimentary false foot, composed of a basial piece and two moveable tubercles, which recall the disposition of the appendages of the sixth abdominal ring of the Paguri, but which is symmetrical on both sides of the body. The terminal plate is rounded at the end, covers the anus, and represents the seventh abdominal posterior feet, which are very short and cylindrical, are elevated under the lateral parts of the carapace, and terminated by a very obtuse rudimentary pincher.

The respiratory apparatus in Birgain presents very remarkable peculiarities of structure. The branchiae are fourteen in number on each side of the body, and are fixed by a peduncle situated towards the middle of their internal surface. The respiratory cavity is very large, and the branchiae only fill the tenth part of it; its vault is carpeted below by a delicate and epidermic membrane; but this soon disappears and leaves naked the skin, which is continued with that membrane, and covered by a multitude of vascular vestigials.

For the natural history of the only species known, Birgain Latro (for the Birgain latiscopa, Latr. is considered to be only the young of Birgain Latro), see the article Birgain.

Fossil Pagurians?

M. Milne Edwards is of opinion that Pagurian Fossilis (Desm. Crust. Foss. pl. xi., f 2) does not belong to that genus, but has much analogy with Callianassa. [Callianassa.]

PAINE, THOMAS, was born on the 29th of January, 1737, at Thetford, in the county of Norfolk. His father, who was a Quaker, brought him up to his own business, that of a staymakery. At the age of twenty he removed to London, where he worked some time at his business, and then went to Sandwich in Kent, where, in 1760, he married the daughter of an exciseman, and obtained a place in the Excise, but retained it only about a year, and then became an assistant at a school in the neighbourhood of London. After leaving this situation he was again employed in the Excise, and was stationed at Lewes in Sussex. Here he had gained some reputation by various pieces of poetry, and had been selected by the excisemen of the neighbourhood to draw up The Case of the Officers of Excise; with Remarks on the Qualifications of Officers, and on the numerous Evils arising to the Revenue from the Insufficiency of the present Salaries, 1772. The ability displayed in this his first prose composition induced
one of the Commissioners of Excessive to give him a letter of introduction to Benjamin Franklin, then in London as a deputy from the colonies of North America to the British government. Franklin advised him to go to America. He took the advice, and having settled himself at Philadelphia in 1774, became a contributor to various periodical works, and in January, 1775, editor of the "Philadelphian Magazine.

In January, 1776, he published in America his "Common Sense," which contributed in an eminent degree to make the people of that country of one mind at the time of the Declaration of Independence. In 1778, he went to the British capital, Bristol, speaks of it as "that celebrated pamphlet which prepared the minds of the people for independence." For this production the legislature of Pennsylvania voted him 5000l. the university of the same province conferred on him the honorary degree of Doctor of Laws. He was also made Clerk to the Committee of Foreign Affairs. During the American War he published at intervals fifteen numbers of "The Crisis" (Philadelphia, 1776-1783), a series of political appeals intended to rouse the states from their slumber and to save the American independent. He was also obliged to resign his office of Clerk in 1779, for having divulged some official secrets in a controversy with Silas Deane, whom he accused of a fraudulent attempt to profit by his agency, in conveying the secret supplies of stores from France to America.

In 1781 Paine was sent to France with Colonel Lawrence to negotiate a loan, in which he was more than successful; for the French government granted a subsidy of six millions of livres to the Americans, and in 1789 he was given the post of minister plenipotentiary by Holland. On his return to America he was rewarded for his services by being appointed, in 1783, Clerk to the Assembly of Pennsylvania; he received from Congress a donation of 3000 dollars; and the state of New York bestowed on him the conferred estate of France, a royalty near New Rochelle, in the state of New York, consisting of 500 acres of well-cultivated land, with a good stone house.

After the peace between Great Britain and America, Paine abandoned himself chiefly in mechanical speculations. In 1787 he went to France, and submitted to the Academy of Sciences at Paris a plan for the construction of iron bridges. Meeting with no encouragement, he crossed over into England, and in prosecution of his projects entered into partnership with an iron-founder at Rotherham in Yorkshire, and explained the principles of his proposed construction in a letter addressed to Sir George Staunton, and printed at Rotherham in 1789. The sums which this undertaking required, together with the failure of his speculations, involved him in difficulties, which however were only temporary.

The first part of his "Rights of Man," in reply to Burke's "Reflections on the French Revolution," was published at London, in 1791; and the second part early in 1792. An analysis of it, written by Erkine, then the Hon. Thomas Erkine, but the jury, with the aid of another attorney, general, to reply, at once pronounced him guilty. Erkine, in consequence of this defence, was discredited from the office of attorney-general to the Prince of Wales. He was tried for the breach of the leading principles of the 'Rights of Man' in Malbou's 'Essay on the Principles of Population,' book iv., chap. 6.

In the meantime however Paine had been chosen by the department of Calais as a member of the French National Assembly, and had landed in France in September, 1792, was received with enthusiastic congratulations. He took his seat in the Convention, and when the trial of Louis XVI. came on, defended the Jacobins by voting that the king should be imprisoned during the period of the war, and having published his "Reasons for wishing to preserve the Life of Louis Capet, as delivered to the National Convention." Towards the end of 1793 he was excluded from the Convention as a foreigner, though he had been naturalised; and in 1796 was arrested by order of Robespierre, and committed as a prisoner to the Luxembourg.

He had finished the first part of his "Age of Reason" just before his imprisonment; it was published at Paris under the auspices of his friend Joel Barlow. The second part was completed during his confinement; and it was published at Paris in 1795, after the author had been set at liberty on the fall of Robespierre. When the English publisher of this work was prosecuted in 1797, Erkine appeared for the prosecution, and a verdict of guilty was agreed on, the judge ordering the plaintiff Watson's "Bible" and a series of Letters to Thomas Paine," appeared in 1796.

On his liberation Paine had asserted his right to sit as a member of the Convention; and on the 5th of December, 1794, he was allowed to resume his place. About this time the government of the United States, by sending a letter to General Washington, in which he invited him to move for the restoration of the post and pay to every person, when arrived at the age of twenty-one years, ten dollars on his fifteenth birthday, stated that he had been an old age plan to go decently out of the World. We give the full title of this Utopian tract as a curiosity. The fund was to be created by taking, on the death of every individual, 10 per cent. of his property, as due to society, and from 5 to 10 per cent. to be added in each generation in perpetuity, until the next of kin was nearer or more remote. He states that this little piece was written in the winter of 1792-3.

Paine remained in France some years longer, but having written to Mr. Jefferson, who had recently been elected President of the United States, and expressing a wish to be brought back to America in a government ship, Jefferson wrote to him, and offered him a passage in the Maryland, a ship of war, which he had sent to France for a special purpose. In his letter, dated March, 1801, Jefferson expresses his highest estimate of Paine's services and the principles of American independence in the following words:—"I am hopes you will find us returned generally to sentiments worthy of former times. In these it will be your glory to have steadily laboured, and with as much effect as any man has, to advance your country, and to advance it in the path of human progress and freedom.

Paine did not embark for America however until August, 1802; he reached Baltimore in the following October. He lived there in retirement for about a year, and in 1803 went to London, and there resided about three years with his second, whom he married soon after the death of his first, when they separated by mutual consent. During his last residence in France he had become intimate with Madame Bonneville, the wife of a very considerable tradesman, who purchased, and brought him to America. After his return he published four or five treatises on iron bridges, the yellow fever, on the building of ships of war, &c.

He died on the 9th of June, 1809, and was buried in a field on his estate near New Rochelle. Cobbett, some eight or nine years afterwards, disinterred his bones and brought them to England; but instead of arousing, as he expected, the enthusiasm of the republican party in the country, his name became a byword for the mode of life which he advocated, and the man for his character and political opinions of his day, and that influence is not yet gone. What he saw and felt, he expressed clearly and forcibly. In his "Age of Reason" he shocked the religious feelings of all
Christians by the grossness and severity of its language, without always convincing those who were well inclined to listen to his arguments. Such difficulties as really do exist in the history could not escape his acuteness; but for want of sound knowledge he sometimes exposes himself when he thinks that he is exposing the sacred writings. This work alienated from him his friends in America as well as in England, excited feelings of the deepest disgust and abhorrence in the whole Christian world of both parties, and exposed him to hatred and insult and calumny to such a degree as to embitter the latter years of his life, and probably to increase, if they did not produce, those habits of intemperance with which he was truly and justly charges.

PAINSWICK. [GLOUCESTERSHIRE.]

PAINTER'S COLIC, called also Devonshire colic, and colic of Poitou, from its former frequency in those parts, is a peculiar and well-known variety of colic, to which lead-workers, miners, and others who use that metal are subject. The symptoms are, severe pain in the belly, with obstinate constipation and occasional vomiting, which is generally followed by partial palsy, and in violent cases by apoplexy. The palsy usually affects the upper extremities, so that the arms hang powerless by the sides, the extensor muscles being the most impaired. Emission and paleness of the muscles affected are of very frequent occurrence.

A first attack, taken under timely management, is for the most part injurious, but with the extent to which the circumstances it rarely endures beyond eight days. But it is exceedingly apt to recur, especially if the patient return to a trade which exposes him again to the poison of lead. Sometimes the primary stage of colic is wanting, so that the wasting of the muscles and loss of power are the first symptoms.' (Christison.)

The principles to be observed in the treatment are, to remove the pain and constipation, and to obviate or lessen the remote effects. In first attacks it is not very difficult to effect the former by the use of a light purgative; but in circumstances where you would search for these symptoms are found more obstinate. Inflammation is rarely a primary symptom, but may ensue, as in other kinds of colic. Want of power in some portion of the bowel, by which it becomes distended, and excessive contraction of ancillary muscles, are the common causes of this symptom. By salines purgatives, such as sulphate of magnesia, sulphate of alumina and potass, or phosphates of soda or solution, followed shortly by a large dose of opium, the constipation may be removed in the milder cases. To counteract the effects of the purgative and to give a more decided action, embrocations or ointments of camphor, cantharides, or other emollient substances may be employed. By these means the patient recovers, and returns to his regular occupation. In more severe cases, nothing is more reprehensible, as it irritates the contracted part of the bowel, and distends yet further the enfeebled and dilated part. Most cases of constipation will yield to pills of aloes and sulphuric acid, in the proportions of one to two parts of each, and powdered aloes. Two of these pills every four or two hours will speedily remove this state.

The paralysed arms must be supported by splints. It is however of little use to cure a first attack, if the sufferer be immediately exposed to the poison of lead. He must be watched and be without the greatest care. Should he be unable to change his employment, he must be very strict in the observance of the following rules: he should never eat without thoroughly washing the hands and face; and never take his meal when in the presence of the smellers of lead,' says Dr. Percival, 'and others also who live in the neighbourhood of smelting-mills, to avoid monotony, to beef, and pork steaks on the hot pigs of lead, by which the flesh acquires a peculiar and offensive smell, is the common practice of the smelters of lead.'

Working it in different suit of clothes should be put on, and when baths are attached to the manufactury, a complete immersion in those, after work, is advisable. The miners of Astton Moor derive great benefit from the saline mineral waters of Crimwell, hot wells, to which they ascend.

Here, besides the chemical constitution of the waters being appropriate, an action on the bowels is caused, and it is observed that an open state of bowels is always a great protection. On this account many masters keep a supply of castor or the premium, to which the workmen have free access. Fat and oily food is likewise a great safeguard. Sobriety is still more effective as a safeguard, for it is observed that among miners, potter, and all persons working among lead, drunkards suffer sooner and most severely. In all cases where the dust of the lead can be kept down by watering, this should be done, as it proves a very valuable means of exemption. Wherever it is practicable, other more innocent articles should be substituted for lead, in the various manufactories where it is now used.

PAINSWICK. On Faced and Pliny (The Effects of Arts, Trades, and Professions.)

PAINTING is that art of design which imitates objects by a colour on a uniform surface.

As compared with sculpture, it is more extensive in the range of subjects it is capable of treating, and more various in the modes in which it affords pleasure by such representation. Those subjects are fitted for sculpture which are sufficiently defined by form alone without the aid of colour, and which tell their story and possess unity without access to so few and so simple, as to be within the reach of the chisel.

The landscape or the subordinate circumstances can at best be only hinted at in sculpture; whereas in painting they are easily represented, and while they are not less effective, they enhance the effect of the picture. Simple form and character in a state of repose are the most favourable qualities for the sculptor; but passion and transient emotion, together with the events of immediate interest, and quite alive, are equally attainable by the painter. The former produces pleasure mainly by beauty of form; the latter works on the eye by the joint effect of form, light and shade, and colour.

In Egypt, painting seems to have originated in the colouring of bas-reliefs and statues: for the most part, when laid on a flat surface, the colour is free from shadow, and consists of the mere local tint, which is often conventional. The paintings executed on the walls of their tombs represent subjects of the class described in the preceding chapter. The scenes of agriculture and domestic life. A very good specimen of the latter class may be seen in the British Museum, representing a banquet. The wooden cases of the mummies are remarkable for the brilliancy of their design. Homer, as he mentions, and Pliny, is evidently in the habit of little attention. Cleanness of Corinth is said to have made the first outline; Arides, of the same city, and Telephanes of Sicyon, to have introduced some lines within the figure; and Cleophas and Pliny to have coloured it with a few more. The embroidered or woven with figures, speaks of nothing nearer akin to painting than the colouring of the ships or the staining of ivory by a Canian woman. The origin of the art is ascribed to Corinth or Sicyon; but the name of its inventor is fixed by Pliny, and Pausanias, and the legend of Cleophas, or Eucreis and Euagramid, having accompanied Demaratus from Corinth to Italy (Olym. 30, B. 657), probably points to the early connection of Greek and Italian art, or to the taste for the former which existed among the Etruscans, and which is sufficiently attested by the innumerable vases with Greek stories and Greek inscriptions now found in Italy. The grotesqueness and eluminance of the figures on the earlier vases, and their progressive improvement, show how little ground there is the notion that the proportions of the human figure in early Greek art were fixed by some type derived from Egypt or elsewhere, instead of gradually developing themselves as the culture of the race advanced.

The very curious pylaia or walls on the walls of the Etruscan tombs should here be mentioned; and Pliny speaks of antient works existing in his time in a temple at Ardea, as well as at Caere and Lanuvium.

Between the 50th and 80th Olympiad (from B.C. 580 to 474, painting seems to have prospered exceedingly in Greece.

Historical pictures of very early events are recorded, one indeed by Buciarchus, in the reign of Candaules, who died Ol. 16, 1, 617. Cicero of Canea invented 'catazapho,' that is, figures seen obliquely from above or below, and thus applied the rules of perspective. The peculiarities of drawing of this early period are best learned from the study of the antient vases; and the forms and protuberance of the muscles are exaggerated, and the positions strained and whimsical.

Polygnotus of Thasos, who probably settled in Athens about Ol. 79, a.c. 485, was the first only antient master of great excellence, and the founder of what may be called the

P. C. No. 1056.
Athenian school. Aristotle (Poet. vi.) calls him ἀρχαῖος, “successful in his expression of character; and Pinty speaks of him as having abandoned the old stiffness, and giving movement to the features—in the adaperie, dents esoterique, vultum ab antiquo rigore variare. His transparent drapery is also mentioned. Pausanias (x. 25-31) describes his pictures in the Lescie at Delphi—

The Capture of Troy, the Departure of the Greeks, the Death of Ulysses, and the Slaves of the Poconne, at the Poconne, at the Poconne. In the Poconne at Athens his works stood by the side of the Battle of Marathon by Panenus, the nephew or brother of Phidas, and of the Combat between the Athenians and the Amazoncs by Micon. This latter artist, together with Ones of Aegina and Domyus of Mikhon, were the most celebrated contemporaries of Polygnotus.

The principles of light and shade were investigated by Apollodorus of Athens about the 94 Od. (B.C. 464). To the school of the Lab. Aegina, the Ionian, in which illusion seems to have been more aimed at. This we may infer from the well-known story of the grapes of Zeuxis and the linen cloth of Parrhasius. The former, with whom begins the second epoch of the more advanced school, and his pupil Parrhasius, are said to have been first instituted at Delphi in the time of Panenus. And although the artist and his patron of the same subject (the Sacrifice of Iphigenia) as that of Timanthes, mentioned in Pliny, in which the grief of the father is represented in the same way by the concealment of the face.

Another school arose at Sicily, in which the most celebrated names were—Euphranor of Corinth (Od. 104-110, B.C. 364-340), Pausias of Sicily (Od. 105, B.C. 364), Aristides of Thebes (Od. 105-112, B.C. 372-332), and Pamphilus of Aegina (Od. 387, B.C. 392-382). The first of these, a sculptor as well as a painter, was laborious and consistently excellent in all that he undertook. Aristides was remarkable for his expression of passion; Pausias practised encaustic painting with great success, having acquired the art from Pamphilus. Pausias enumerates three modes of encaustic painting—1st, without wax, with a hot piece of ivory; 2nd, that in which the colours were combined with wax and laid on with a stylus and burnt in; 3rd, the mode adopted for painting ships: but it is almost impossible for us to form any notion of this process from the few vestiges discovered by the lictor. Pausias was noted for his children and lighter subjects, and first decorated roofs and arches with figures. Pamphilus succeeded in establishing a knowledge of the rudiments of drawing as part of a liberal education. He was the teacher of L. Scipio over Aegina, and of the softening and colouring of Ionia with the science of the Sicilian school. His excellence in female beauty was attested by the Venus Anadyomene at Cos; his power in sublime subjects and his technical skill, by the Alexander wading the Thunder at Ephesus. He, like other sculptors, first aimed at notice a rival of his fame. Protagones of Rhodes, or rather of Caunus in Caria. This artist excelled in a laborious study of nature, and Apelles declared that his own superiority over Protagones consisted in his knowing when to take his subjects, their behaviour, his figures reduced and painted, and his manner and historical subjects on a large scale.

The sentiments possessed also their painters of low and domestic scenes, chrysoprapheos, of whom Pliny names Pyreus, Cadmus, and Antiphoes. At Rome, C. Fabius Piator is said to have derived his name from decorating the temple of Health (A.D.C. 450, B.C. 304). The poet Pausanius (B.C. 219-140) was an artist. The victory of L. Scipio over Aegina (B.C. 190) is recorded by a picture in the Capitol, as that of M. Valerius Messala over Hiero had been by an historical painting in the Curia Hostilia (A.D. 264). The first foreign picture publicly exhibited at Rome was after the sack of Corinth by Mummium (A.D. 146), an event which caused some commotion, but even little the victors were qualified to appreciate their real worth.

At a later period we hear of Arellius, Amulus, Aeron, Perrius, and Lustrum, of which the last is in the triumph of Lucullus, landscapes, garden scenes and buildings as the walls of rooms, such as we see in the ruins of Pompeii or the remains of the palace of Nero. Caesar purchased 2' Ajax' and the 'Medea' of Tunomachus for 30 talents, and wisdom to the eminent artists, at Cyprus. The forced bloom of art which characterises the age of Hadrian implied a momentary revival of painting, and的动作 (of whom Lucian speaks so highly) may possibly be reckoned as his contemporary.

It remains to say something of the general qualities of ancient painting and the materials used by them. The painting of ancient Greeks remained dependent on architecture for a longer period than sculpture, and it seems always to have been strongly influenced by the latter art. The work of the ancient artist was simple, and resembled the order of a base-relief. A good instance of this is the well-known Alcobrandini Marriage. The figures stand separately: 'Spatais distinguamur'—we understand. (Quintilian, Inst. viii. 2. 34.) The best of the finest works of art—those concerning city, town, or the remains of the palace of Nero. Caesar purchased 'Ajax' and the 'Medea' of Tunomachus for 30 talents, and used 200 talents of gold and 400 talents of silver, in the decoration of the palace of Caesar. The forced bloom of art which characterises the age of Hadrian implied a momentary revival of painting, and the action (of whom Lucian speaks so highly) may possibly be reckoned as his contemporary.

The four colours which were the basis of the colouring of the ancient the down to the time of Apelles were—1, white. Melian earth, or, more rarely, cerusium, white lead; 2, red, red lead and placenta; 3, black, the pitch of the Syros, from the Attic silver-mines; 4, black (probably including blues), sforas, from burnt plants or stor. These were the 'colores muteri,' to which were afterwards added the 'colores muteri,' or the latices which were usually furnished to the painter by his employer. Vermilion (cinnalear) was called minimum by the ancient artists, what we call minimum (red lead) was by them termed 'cerusium.'

The following is a short summary of the experiments of Sir H. Dury on antient colours from the walls of the baths of Titus and of Livia, and from other ruins at Rome and Pompeii. Some vases were also found beneath the palace of Titus containing colour, and in one of them were three kinds of the one pitch and the other two. The yellows were ochres mixed with zinc and yellow oxide of lead, 'massicot.' Orpiment (sulphuret of arsenic) is mentioned by Pliny and Vitruvius under the name of arsenae, but none was found by Dury. All the blues were of the same character, and the 'colores muteri' the same. The yellows were of iron and manganese, and the 'massicot.' Iron was discovered in Egypt and made at Perugia; Pliny and Vitruvius speak of Indian blue supposed to have been indigo, but none was found. The greens proved to be carbonate of copper; and in one case the green earth of iron was used. The 'colores muteri' of the red ochres of the other walls, but some is supposed to have been discovered in an altered state in a broken vase. The blacks agreed with the description of the antients, as being the charcoal or mix of resins and of iron and manganese, and the 'massicot.' iron and manganese, which was discovered, but the whites were either carbonate of lume or fine white clay. The ground on which the colours were applied agreed with that described by Vitruvius, and consisted of porphyry, marble, cemented with lime, and highly polished. No traces of scord as used by encaustic painters were found by Dury.
Italian Schools.—The earliest professors of Christianity appear to have abstained from the use of images and the practice of the arts, bound up as they were with the abominations of heathen worship. Very little trace of Christian art is discernible before the time of Constantine, when the next great change became evident. The church painters to her own purposes those means of affecting the imagination which had hitherto so effectually served her rival.

We do not of course trace that gradual attempt to improve the technical part of the arts of design which is visible among the schools of the West. The Christians found the shell of antient art yet remaining; the traditional handicraft existed, but the spirit which had enlivened it was red.

In the very early Christian works a certain tendency to emulous and dignified peculiarly visible. The first representation of Christ in the character of the good shepherd is mentioned by Tertullian (*De Pauciit., cap. 10*). The walls of the catacombs of Rome and Naples displayed stories from the Old Testament as typical as the paintings of the East. The Christ appeared in a form that was immediately adopted by the church painters of the next age. The Christians found the shell of antient art yet remaining; the traditional handicraft existed, but the spirit which had enlivened it was red.

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The subject of Orpheus was not uncommon, apparently with some mystical reference to Christ.

St. Augustine, in the latter half of the fourth century, speaks at least immediately after the fifth, of 'a less pictura,' (*Cont. Faust., xxii, 73*), and refers to the representation of St. Peter and St. Paul accompanying our Lord (*De Consens. Evang.*, i. 100). Some of the most interesting remains of early art are to be found in illuminated MSS. of the ninth century; Angelica Gaddi, formerly in private collection, is a fine example of a MS. of the Book of Joshua in the Vatican Library. The execution of these miniatures is said to be very good; while the costume and the representation of towns and rivers by the personifications familiar to the ancients, is marked by a peculiar spirit.

In the fifth century, the erection of sumptuous basilicas gave occasion for a great display of mosaic. In heathen times the images of the Caesars, the only objects of universal adoration throughout the Roman world, had been placed in the temples; the buildings; and when they were adapted to Christian worship, the colossal figure of Christ with his apostles was usually displayed on the half cippola above the altar. These representations of the Saviour and his apostles, especially St. Peter and St. Paul, bear marks of that type which may be traced back to a very early period, and which in after times became the groundwork of the highest dignity and beauty without losing its peculiar character. Their costume is generally more or less antique, consisting of the tunic and the pallium, with some vestige of the cloak. At Ravenna, the art of mosaic, the form of art, as of everything else, continued in all its pomp. Great mechanical skill in the use of gilding, joined to an anxious and spiritless imitation of older forms misunderstood, long continued to characterise the mosaic work in Venice and the adjoining cities. The Lombards could not bring no art with them, and were unlikely to appreciate what they found. The most remarkable monument of their time is the large MS. of the Bible from Monte Amiata, still preserved in the Laurentian Library at Florence. The union of typing and the decorative art, the alinement of the letters with the ideas, the beauty and the utility, were combined in a manner which has scarcely received the notice due to its early merit, owing to the fact that the history of art has been written principally by favourers of the new style. The city of Florence slowly replaced that of the former when the Ghelbinnel interest was crushed by the fall of the house of Hohenstaufen.

In San Domenico of Siena is a picture, by Guido di that city, with the date of 1242. The face of the Virgin shows traces of the type which afterwards characterised the Siensese school. Nearly contemporary with this painting were the works of Giunta di Pisa, and probably those in the Baptistery of Parma. Cimabue was born at Florence (according to Vasari) in 1240; his great picture in Santa Maria Novella is conceived with grandeur, and shows marks of the struggle then about to be made in painting. The frescoes at Assisi are particularly important for this period of the history of art. The next great name which requires notice is that of Giusto di Bondone, born near Florence in 1276 (d. 1336). His work has been compared to that of the 'Purgatory' of Giotto, and Cimabue in the estimation of his countrymen. What Giusto really did in art has often been mistaken. Instead of adhering religiously to the old type in sacred subjects, he directed attention more to real life, and gave to the Florentine school the real character of a religious and commercial spirit of that great republic, which remained for a long time characteristic of the masters who followed him. It is probable too that he replaced the thick dark-toned vehicle used by the Greeks by some more colourless medium, resembling that of the early Italians, perhaps the yolk of egg and juice of young fig-shoots, which is mentioned by Vasari and by Cennino Cennini, but by the former ascribed to the Byzantines. The only picture of which the name is that in Santa Croce. The cast of his faces is singular: the eyes are long, narrow, and placed near together; the nose of a peculiar form, and the chin projecting and angular. The most important works for the history of the Florentine school is the fresco of the Virgin, in the Baroncelli chapel in Santa Croce, and a portion of the paintings in the Spanish chapel of Santa Maria Novella, by Taddeo di Gaddo (b. about 1300), the godson and pupil of Giusto; some frescoes also of the life of the Virgin, by the former, in the church of Prato; and the works of Andrea di Cione (or Orgagna, d. 1389), at one a painter, sculptor, and architect, in the Campo Santo at Pisa and in Santa Maria Novella. At Siena, Duccio di Buoninsegna contracted, in 1308, to paint the frescoes of the picture standing up in the cathedral of that city. It consists of a number of small compartments representing the life of Christ, and gives a high idea of the artist's powers of imiation and composition. Simone di Martino, whom Vasari calls Simone Memmi, and ranks among the pupils of Giotto, in 1328, before the old form of that master's fame, and no such connection as that of master and scholar is alluded to by Ghiberti. Lippo di Memmi worked in concert with Simone, and a joint picture with their names and the date of 1335 is to be seen in the gallery of Florence. The work is a large paperlike picture, by Taddeo di Bartolo, and others, in the palace and academy of Siena, enable us to judge of the excellence of that school at the end of the fourteenth century. Its characteristics are an adherence to the type of the Florentine, but a tendency to the following were practised by their Florentine contemporaries; a darker colouring in the flesh and a form of face characterised by being contrary to every particular to that adopted in the old Cologne school—the nose is straight and dis proporcionate; long, the forehead flat, and the eyes half closed and lengthened out, and the whole face oval. At the beginning of the fifteenth century a fresh impulse was given to Florentine art, through the advances made in sculpture by Lorenzo Ghiberti (b. 1378, d. 1455), Donatello (b. 1381, d. 1466), and Luca della Robbia (b. 1386, according to Vasari). The groundwork was thus secured for profiting by the genius of the two great men, Fra Angelico da Fiesole (b. 1389, d. 1455) and Masaccio (b. 1401, d. 1428), who supplied respectively the finest feeling for the gentle and tender side of the figure, and a new position, joined with the requisite relief by light and shade. The best works of the former are to be seen in the Academia and the Gallery at Florence, and in his own convent of St. Mark in that city. A picture of great excellence from St. Domenico at Fiesole, painted by Masaccio, is jointly with those of his master Masolino and of Filippino Lippi, decorate the Brancacci chapel in the Carmelite church at Florence.

The school of Florence now produced masters of first-rate excellence, of whom the following were the principal: Filippo Lippi (b. 1412, d. 1469), painted, besides many smaller pictures, the frescoes in the choir of the cathedral of Prato. Alessandro Filipepi, commonly called Sandro Botticelli (b. 1447, d. 1514), executed some works in the Sistine Chapel. The features of his females are in general far from beautiful, though there are exceptions, as in the picture of the Crowning of the Virgin in the Florence Gal lery. Filippino Lippi was the son of Filippo Lippi (b. 1460, d. 1504). His powers may be judged of by his frescoes in
We have now brought up our account of Italian painting to the end of the fifteenth century, when, from the school of Ghirlandaio, of Verocchio, of Perugino, and of Bellini, were bursting forth M. Angelo, Leonardo da Vinci, Raphael, Correggio, and Titian. As the lives of these painters have a place under their respective names, we shall bring their work here on their position with reference to the general history of art. Leonardo da Vinci was born in 1452; he died the year before Raphael, 1519. In the eagerness with which Raphael was received by his master, his work he anticipated M. Angelo, as he rivaled him in the varied application of his genius. It was Leonardo that we first recognize a thorough feeling for the roundness of objects, and a greater breadth and simplicity of character (p. 149).

If it be true that Pietro Perugino studied in the school of Verocchio, Leonardo may have gained from him the pensiveness and gentle conception of sacred subjects which he combined with so exquisite a sense for the beauty of form. In connection with Raphael, his pupil Lorenzo da Credi (d. 1530), who imitated his style, and with great tenderness and purity of feeling, Bernardino Luini (painted in 1530) has left at Milan and elsewhere many works which have been ascribed to Raphael. In every respect the master of the principal assistant of Leonardo. M. Angelo Buonarroti (b. 1474, d. 1564) was at once painter, sculptor, architect, poet, and musician. Educated in the school of Ghirlandaio, he was, by the suggestion of his character and the stamp of his mind, in every respect the most independent of masters.

The frescoes of the Sistine Chapel single grandeur characterizes the prophets and sibyls: less mature but equally capable of great feeling, the whole is such a work as could only have been produced by the union of a painter and architect. The Last Judgment displays the greatest power, but must be admitted to want a true Christian character. The God of the Old Testament pervades his works. He executed very few cabinet pictures; perhaps one that can be authenticated, except the Holy Family, 'a tempera,' in the Brera at Florence. His pupil Marcello Venusti (b. 1515, d. 1576) painted from his master's painting, but the groundwork of some of the pictures of St. Sebastian, probably, among others, for the Raising of Lazarus, now in the National Gallery, London. His most independent pupil was Daniele Ricciarelli, or Daniele da Volterra (b. 1560, d. 1625), whose pictures are rare out of Italy: they show fine devotional feeling, with mellow colouring, and dignity of form. The best are to be seen in the church of San Romano at Lucca and in the Pitti with Leonardo, must be mentioned.

Contemporary with these masters must be mentioned Baccio della Porta (b. 1469, d. 1517), commonly called Filippino, a Dominican monk, and the friend of Vincenzo, educated in the school of Raphael, to whom he is professed to have profited by the works of Leonardo. His pictures are rare out of Italy: they show fine devotional feeling, with mellow colouring, and dignity of form. The best are to be seen in the church of San Romano at Lucca and in the Pitti with Leonardo, must be mentioned.

Andrea Vanucci, commonly called Andrea del Sarto (b. 1488, d. 1530), was originally a pupil of Piero di Cosimo. Among his earliest works are the frescoes in the court of the Scalo and among his best, those in that of the Annunziata, both at Florence. His execution is uncommon: a very good and late one is the Sacrifice of Isaac, at Dresden. His forms have great breadth and simplicity. In 1516 Andrea visited France, but destroyed his own character by returning to his master, and others, for the money belonging to Francis I. M. Antonio Francia and Jacopo Carucci (called Pontormo) imitated Andrea del Sarto.

Raphael Sanzio of Urbino was the son of Giovanni Sanzio, himself a painter. He was born in 1483 and died young, but his impression on the age was very great. His female forms or surpassed the power shown in his larger works. The difference between his best pictures and those of other painters is one of kind rather than of degree, and the quantity which he produced in a short life is as remarkable as the fact that his forms, and even the brushwork, can be called ordinary in expression or careless in execution. In his Madonnas he enhanced the simple beauty and pure feeling of the Umbrian school. In his frescoes he rivalled the grandeur of Buonarotti, and in his portraits he surpassed the truth and individuality of Titian or Vandyke.
The pupils of Raphael were numerous, and the dispersion which followed the sack of Rome by the Imperials, in 1527, spread their works and influence far and wide throughout Italy. Giulio Pippi, or Giulio Romano (b. 1491, d. 1546), was the most celebrated of Raphael's scholars. He had painted a portion of the frescoes in the Vatican from his master's designs. After his death he executed some very remarkable works, which were more enthusiastic and deeper than representing the Fall of the Giants. His altarpiece in S. Stefano at Genoa is a very fine work. His forms are antique, but he wanted the pure grace of Raphael, and in his oil pictures the tone of his shadows in the flesh is more vivid than his color. A son, an admirer of his master's art, who painted much in France, was a pupil of Giulio. Giovanni da Udine (d. 1564) was Raphael's principal assistant in the execution of the fruits, flowers, and other objects in the art of painting. Others, like Pierso Foscari, or Pierso del Vaga (b. 1501, d. 1547), painted at Genoa; and Gian Francesco Penni, surmained Il Fattore (b. 1488, d. 1528), carried the principles of Raphael's school to Naples. Timoteo della Vita, of Urbino (b. 1470, d. 1524), and Bartolomeo Ramenghi, or Il Bagnaccavalo, came from the school of F. Francia to that of Raphael, and the latter returned to Bologna. Benvenuto Tisi, surmained Garofalo (b. 1481, d. 1559), came from Ferrara, and carried back thither what he had acquired at Rome. His pictures are not uncommon, and his name is perhaps the most unequivocal expression of their heads. Dossi Dosso (b. 1474, d. 1568) and his brother were contemporaries of Garofalo in the school of Ferrara. Finally, among the pupils of Raphael must be reckoned the Netherlandler Michael Cofis, of whom we speak in another connection. His most extraordinary works are to be seen in S. Domenico di Siena, and at the convent of M. Uliveto Maggiore. Domenico Beccafumi, surmained Mecccherino (b. 1493), worked with Razzi. His forms are good and his colouring pleasing. The inmost nature of the cathedral of Orvieto is prudently found in these designs. Baldassare Peruzzi (b. 1491, d. 1536) is better known as an architect than as a painter.

To turn to the north of Italy, Antonio Allegri, or, from his birth-place, Correggio (b. 1494, d. 1534), probably was instructed in the school of Mantegna, but after the death of Andrea. Nothing in the art of history seems so premature as the style of Correggio. His expression, to say the least of it, often borders on affectation. His early picture at Dresden shows the least of it; but with time the effect of such perfection. No other artist ever played with light and shadow as he was wont to do. His half tones and his reflected lights produce the effect of illusion. He knew his power, and delighted in displaying it in the conquest of difficulties from 1490. Another master of the design of Michelangelo of Coreggio are, the Noette and other pictures at Dresden: his St. Jerome at Parma; the frescoes in the cathedral of that city, and in the convent of St. Paul. Those purchased from the Marquis of Londonderry for the National Gallery, especially the Egrets, are excellent specimens of the master. The tendency to affectation visible in Coreggio was a dangerous legacy to the school of Parma, and its evil consequences are especially visible in the works of Francesco Mazzuoli, or Il Parmigianino (b. 1503, d. 1540), to whom it was necessary to deny great power and great feeling for beauty.

The Roman School had cultivated beauty of form and composition, Coreggio perfected chiaro-scuro, and it was in Venice that colouring attained its highest pitch. We have mentioned the most famous school of painting in Rome at a very early period. Giorgio Barbari da Castelfranco, or Giorgione (b. 1477, d. 1511) steeped in a rich glow of mellow light those full forms of Venetian beauty which hold a middle place between the clamor of the Flemings and the more slender outlines of the other Italian schools. The most eminent of Giorgione's scholars was Sebastian del Piombo (b. 1485, d. 1547). His portraits are very grand, and his historical pictures, like our Raftes, from 1490 onward, the design of Michelangelo with Venetian colouring. The style of Giorgione had considerable influence on Jacopo Palma Vecchio and on his fellow-pupils Tiziano Vecellio (b. 1477, d. 1576).

We possess in England good specimens of Titian's works, especially in the National, the Bridgewater, and Fitzwilliam Galleries (at Cambridge). The brilliancy of his high lights and the ruddy transparency of the skin in his flesh are most marvellous; his large compositions, which, like most of his countrymen, he executed in oil instead of fresco, must be seen at Venice. It is impossible to convey the consummate art of the Venetian masters in their landscapes, or more reality than animates his portraits. Bonifazio (b. 1491, d. 1553), Andrea Schiavone (b. 1522, d. 1582), and Alessandro Bonvicino, called Il Moretto of Brescia (b. 1564), were distinguished imitators of Titian. Gio. Battista Piazzetta (b. 1568, d. 1637), called Il Moretto of Brescia, was a pupil of Moretto. Pordenone (b. 1484, d. 1539) and Paris Bordone (b. 1500, d. 1570) are remarkable for the softness and richness of their colouring and the expression of their heads, especially in portraits. The most productive painter of the whole Venetian school, which maintained its original character and force for a considerable period, was Jacopo Robusti, called, from his father's trade, Il Tintoretto (b. 1512, d. 1594). He painted much by lamp-light, and thus acquired a specialness in his shadows which is sometimes unmeaning, but his own facility of execution was the real bane of his reputation. Some of his works, such as the Crucifixion, in the school of St. Roche at Venice, are as large as scenes in a theatre, and his pictures are most remarkable for their colouring. At Verona, Paolo Caliari, or Paolo Veronese (b. 1528, d. 1588), applied in a peculiar way the principles of the Venetian masters. The brilliancy of his banquets and festal scenes is perfectly astounding, and full effect is given to the peculiar views and tints of light, and the truth of the cool transparent atmosphere of the background.

The best specimens of his works are, the large picture in the Louvre, Christ at Levi's Table in the Doge's palace, and Mary Magdalen at Christ's feet in the Durazzo palace at Venice. His son and scholar Carlo Caliari was far inferior to his father. The family of Da Ponte, from Bassano, produced three painters. Jacopo, the father (b. 1510, d. 1592), after studying at Venice, returned to his native place, and painted innumerable representations of country and household life, or sacred scenes, as such, in a strong, rich colouring. His two sons, Francesco and Leandro, have left some good pictures at Venice.

We have now arrived at the period when art appeared and thus declined. Venice was in some degree an exception; but at Florence, says Negri, 'the scenes and the attitudes of academic models, and hard opaque colour are the characteristics of many of those masters who thought they were following M. Angelo. Such for the most part, although the fine works at Florence, and the painting, the historian of painting (b. 1512, d. 1574), Angiolo Bronzino (b. 1501, d. 1570), and Alessandro Allori, his scholar, also called Bronzino (b. 1535, d. 1607). While Giuseppe Cesari, surmained the Cavaliere d'Arpino (b. 1560, d. 1640), enjoyed a great reputation for a work of art. They succeeded however in elevating the character of painting far above that which it bore in the hands of their immediate predecessors, and joined earnestness and devotional feeling to great
technical excellence. Ludovico has the merit of being the teacher; Agostino painted less than the other two, and Annibale is without doubt the most distinguished. His frescoes in the Palazzo Farnese at Rome, and his pictures in the gallery at Bologna, especially the former, give the best idea of his real worth. From this school of the Carracci issued a series of great masters, of whom the following were the most eminent: Zaccaria, Zamboni, Domenichino, Zocchi (b. 1581, d. 1641), in whose works a thorough feeling for beauty and great strength of conception and execution are visible. His most celebrated oil picture is the Communion of the Holy Eucharist, in the yacht, in which however the composition is essentially the same as that from Carracci. The best frescoes are that in the cathedral at Fano, in St. Luigi at Rome, and those at Grotta Vettura. Like Annibale, Carracci, he was an admirable landscape-painter. Francesco Albani (b. 1578, d. 1660) painted Cupids and groups of a mythological character, which sold for a state above prettiness. His best scholars were Gio. Battista Mola (b. 1620), Carlo Cignani (b. 1628, d. 1719), and Andrea Sacchi (b. 1594, d. 1668). A very fine picture by the last master is in the Vatican. Carlo Maratta (b. 1625, d. 1713) was his scholar. Gio. B. Cini (b. 1574, d. 1649) stands among the first of the Bolognese school. His conception of beauty, formed by a contemplation of the antique, would be more satisfactory if it possessed more individual life, and was free from the somewhat insipid sameness of a mere abstraction. In his early works, his figures with greys of the Innocents, the large Pietà, and the Crucifixion, in the Gallery at Bologna, belong to this period. The Aurora, in the Palazzo Rospigliosi, is of his middle style, when he passed to more sombre and more coloristic subjects. The later works, of which the tone is often leaden, and the forms, though beautiful, are vague and spiritless. Gio. Francesco Barbieri, surmamed Guercino da Cento (b. 1590, d. 1666), showed perhaps greater power of expressing passion than Guido, and was less attracted by an ideal type; in his early works there is a force and fullness of shadow, which was exchanged afterwards for a lighter and milder manner. His St. William at Bologna, and St. Thomas in the Vatian, are good speciments of the former; the Abraham and Hagar, at Milan, of the latter. In his later pictures he hold a place between the Ecclectic school and the Naturalists. In the hands of Fanbrico (b. 1581, d. 1647) painting again degenerates into a mere handicraft, with great exaggeration, but little real expression. Gio. Batista Salvi (b. 1655, d. 1663), called Annibale, and Giovanni Battista d'Orbino, is named of those who have been a pupil of Domenichino. His pictures have no great depth or force, but show considerable beauty without affectation. The last of the Ecclectic school, that of the Procaccini, arose at Milan, which produced, among other masters, Gio. Batista Crespi (b. 1557, d. 1653) and his son Daniele. At Rome, Federigo Barocci of Urbino (b. 1528, d. 1612) imitated the style of Correggio. His best followers were Ludovico Cardi da Bologna (c. 1533), and Cardinal Alessandro (b. 1577, d. 1621). The Judith of the latter, in the pitt, is a very fine picture. Carlo Dolci (b. 1616, d. 1686) followed much the same course as Sassoferrato, but not always with as little affectation. A high finish and smooth cold colour often hold the place of higher qualities. Pietro Berrettini da Cortona (b. 1596, d. 1669) laid the foundation of that empty mannerism in Italian art which prevailed through the latter part of the seventeenth and the whole of the eighteenth century.

The last of the Bolognese schools were those masters who seem to have imagined that a true imitation of nature consisted in appropriating to every and any subject the first forms which came in their way, instead of selecting such as thoroughly suited the conception of the particular scene to be represented. Among those most devoted to this method were Giuseppe Riba, or Lo Spagnuolo (b. 1592, d. 1656), has left in St. Martin a masterly Descent from the Cross. There is in him much that reminds us of his native country. He was dark and powerful in his shadows, and shrank from the representation of no scene however horrible. Salvator Rosa (b. 1615, d. 1673) was a man of most varied taste. He loved landscapes (often wild scenes in the Apennines) and his battle-pieces are best known and superior to his historical pictures. Luca Giordano, surmamed 'Fa Presto' (b. 1632, d. 1703), may be considered as closing the seventeenth century. In the eighteenth period, though art undoubtedly declined, still much that is good may be found in the works of Jacopo Palma the younger (b. 1544, d. 1628), and in those of Alessandro Varotari, or II Padovanino (b. 1570, d. 1650). In the eighteenth century, the most remarkable of the Bolognese is Scipione Pulzone, or Bellotto or Canaletto (b. 1724, d. 1790) executed those well-known views which have never been exceeded for truth and out-door effect.

Northern Schools.—Illuminated MSS. still remain as monuments of German art in the ninth and tenth centuries. The marriage of Otho II. (978-983) with the Greek princess Theophania probably gave the German artists access to the technical skill of the Byzantines. Towards the end of the twelfth and beginning of the thirteenth centuries various signs of new forms of art begin to show themselves. In the 'Caricle' of Wolfram von Eschenbach, who lived early in the thirteenth century, the painters of Cologne and Mainz are especially mentioned, and the figures of the Apocalyptic Lamb and the Vision of St. Ursula are the only latterly extant. In the reign of Charles IV. (1346-78) artists seem to have existed in Bohemia; but towards the close of the thirteenth century the school of Cologne was founded. A contemporary chronicler, in 1380, as the best master of his day. Pictures of his are to be seen in St. Castor at Coblenz, St. Clara in Cologne, and in the Boissier collection. The great altar-piece, formerly in the chapel of the Scholasticum, has been bought by the city. Kaiser, in 1876, supposed to have been painted by Meister Stephan, and bears the date 1410. The richness of the colouring rivals that of Giorgione, and the dignity and beauty of the Virgin are most remarkable. A branch of the Cologne school appears in Westphalia, particularly in the city of Minden, where the connexion has been traced between the German and old Flemish masters, though very probably existed. Hubert and John van Eyck was the fertile in good painters; among them were Gerard van Meerssen, Hugo van der Goes (some of whose pictures are found in Italy), Roger van Brugge, and more especially his pupil Hans Holbein the Younger. Some beautiful works of this last master are preserved in the Kunsthistorisches Museum at Vienna, where Holbein the elder, of Augsburg, worked about 1500, but it was at Nürnberg that the German school displayed its full power. Michael Wolgemuth, of that city (b. 1434, d. 1494), was the master of Albert Dürer (b. 1471, d. 1528), a painter who scarcely appears in comparison with any of his great Italian contemporaries. The earliest undoubted picture of Dürer's is his own portrait in the Florence Gallery; among his latest and most successful are his Apostles, now in the Munich Collection. In 1506, Dürer visited Venice, but the Venetian school does not seem to have exercised so much influence over him as that of Flanders probably did in a
journey undertaken at a later period (1820-1). Of Dürer's excellence as an engraver we need not speak here. The principal artists of the Nürnberg school, after its great leader, were Hans v. Kulmbach, Henry Aldegrever, Bartholomew Beham, Albert Alt dorfer, and George Pens. The last last name was a pupil of Vasari's. His brother, Lucas Cranach (b. 1472, d. 1553) was court painter to the three electors, Frederic the Wise, John the Steadfast, and Frederic the Magnanimous. He accompanied the first to the Holy Land in 1493, and shared the prison of the last after the battle of Mohacs. Of Vasari's six sons, Lucas, also a pupil of Cranach, was bishop of Wittenberg and a friend of Luther, whose marriage with Catharine von Bora he contributed to bring about. His pictures are fanciful, and the features of his females most singular. Lucas Cranach, the son, was also a painter. In his art he sought to notice Correggio's English touch of light and shade, and to imitate the lower objects of poetry for high and poetical feeling. The depth and brilliancy thus produced seem hardly attainable by mere colour on a flat opaque surface, and when we look at his numerous etchings, we marvel still more how his needle on the copper has almost surpassed his pencil on the canvas. Conscious of his power to attain sublimity by light and shade alone, he seems often to have rejoiced in showing how that one charm could make us heedless of coarseness of conception and meanness of form. Rembrandt's principal pupil was the crucified artist; and there is visible in almost all their works a certain whimsical and fantastic feeling totally different from anything to be seen in the old Florentine or Sienese painters. We must pass briefly over Quintin Messas, the blacksmith of Antwerp (b. 1506, d. 1579), whose Minstrels at Windor are well known. The later works of John Mabuse (b. 1509, d. 1562) and the pictures of Michael Coxi (b. 1497, d. 1592) show that forced imitation of the Italians which characterises the transition from the old Flemish to the school of Rubens. But rather than of the latter of these, his master and pupil, Floris (b. 1520, d. 1579), in the elder and younger Franks (b. 1544, d. 1516; b. 1580, d. 1624), in Bernard van Orley (b. about 1490), and Otho Venius (b. 1556, d. 1634), the master of Rubens. The works of these artists and their contemporaries are described in independent and genuine feeling, though they interest us as being the groundwork of the school of Rubens.

The Spanish Netherlands, rescued from Protestantism by Don John of Austria and the prince of Parma, witnessed, in the latter half of the sixteenth century, a partial revival of painting more striking than that effected by the Caravagio, Peter Paul Rubens was born at Cologne in 1577, and died at Antwerp in 1640. After leaving the school of Otho Venius, he visited Italy, and studied particularly the works of the Venetians, his early and genuine art more attractive than those which were executed when the overwhelming number of commissions obliged him to employ unsparingly the pencil of his pupils. The 'Descent from the Cross', in the cathedral of Antwerp, is one of the most perfect works of Rubens. He is equally great in history, in landscape, and in portrait. In complaint that the fire of his genius was not extinguished as in the great Italian masters, is to wish that the artist had been a different individual from what he was. His historical pictures are lovely. Rubens, with his faculty of execution, their energy, and their brilliancy hurry us beyond such considerations; when we think of them, we may regret that their forms are often ill-selected, and that the brute animal vigour of his bacchanals is in some paintings unseemly. The most celebrated of the pupils of Rubens was Antony van Dyck (b. 1599, d. 1641). At first he imitated closely the peculiarities of his master, but after his residence in Italy he adopted a more tranquil tone of feeling and soberer colouring. His historical and portrait pictures are models of composition in their way to the numerous and admirable portraits, many of which were executed during a residence in England, and still remain in this country. Of the other scholars of Rubens, few did more than imitate and sometimes exaggerate the outward characteristics of their leader. The best among them were Jacob Jordaeus (b. 1584, d. 1678) and Gaspar de Crayer (b. 1585, d. 1669).

In Holland, Michael Mierevelt (b. 1567, d. 1641) and Franz Hals (b. 1584, d. 1666) painted history and portraits, especially with artistic success. The other of Van Hout (b. 1613, d. 1670) approached very closely to Vandycck in colour. His finest work, the Festival given by the Burgheur-guard of Amsterdam on the conclusion of the treaty of Westphalia, is in the museum of that city. Another excellent painter is in the family of Noardt.

The great master of the Dutch school however was Paul Rembrandt van Ryn (b. 1606, d. 1674). In his portraits and ideal heads we find the most wonderful truth and dignity, but his peculiar power consisted in a masterly use of light and shade, which impressed the lowest objects with a quality of poetry for high and poetical feeling. The depth and brilliancy thus produced seem hardly attainable by mere colour on a flat opaque surface, and when we look at his numerous etchings, we marvel still more how his needle on the copper has almost surpassed his pencil on the canvas. Conscious of his power to attain sublimity by light and shade alone, he seems often to have rejoiced in showing how that one charm could make us heedless of coarseness of conception and meanness of form. Rembrandt's principal pupil was the crucified artist; and there is visible in almost all their works a certain whimsical and fantastic feeling totally different from anything to be seen in the old Florentine or Sienese painters. We must pass briefly over Quintin Messas, the blacksmith of Antwerp (b. 1506, d. 1579), whose Minstrels at Windor are well known. The later works of John Mabuse (b. 1509, d. 1562) and the pictures of Michael Coxi (b. 1497, d. 1592) show that forced imitation of the Italians which characterises the transition from the old Flemish to the school of Rubens. But rather than of the latter of these, his master and pupil, Floris (b. 1520, d. 1579), in the elder and younger Franks (b. 1544, d. 1516; b. 1580, d. 1624), in Bernard van Orley (b. about 1490), and Otho Venius (b. 1556, d. 1634), the master of Rubens. The works of these artists and their contemporaries are described in independent and genuine feeling, though they interest us as being the groundwork of the school of Rubens.

Peter Brougel the elder (b. 1519, d. 1590) was called Bore-Brougel from his residence in Bore, as his son, Peter Brougel the younger, obtained the name of Hell-Brougel, from the fantastic scenes which he portrayed. The Temptation of St. Anthony was in like manner a favourite subject of the elder Teniers (b. 1592, d. 1649), who by no means equalled his son and pupil David Teniers (b. 1610, d. 1690) in those scenes of merry-making and peasant life for which he is so celebrated. Nothing can surpass the reality of the vulgar comfort with which his figures, or that of his son, or that of his grandson, present their larger assemblies. His colour is cool and his touch firm and vigorous. Sometimes he amused himself with imitating the works of masters of a different cast. In Adrian van Ostade (b. 1610, d. 1682) we have the same subjects treated with a greater simplicity, and a warmer and more fluent tone, but not of the same individual truth and character, though with greater attention to general effect, than by Teniers. Isaac van Ostade painted fewer interiors, and followed his brother's style, with less success. The humour of Adrian Brougel (b. 1603, d. 1668), d. 1638, the son of the elder, is better preserved in the scenes which he painted, is of a broader cast. In Jan Steen (b. 1636, d. 1689) there are satirical touches and a genuine comic unity which equal Hogarth. The picture in the Duke of Wellington's gallery is an excellent specimen of these qualities, and in the picture which bears the same relation to the drinking-bouts of Teniers or Brougel that genteel comedy does to broad farce. In this Gerard Terburg and Gerard Dow stand pre-eminent. The former (b. 1606, d. 1681) threw into the scenes...
which he represented a delicacy of feeling and a sort of decorum which added greatly to the value of his execution and high finish. Of this kind are the celebrated Satin Gown, engraved by Wille, the Trumpeter at Munich, and the celebrated Valenciennes Charger in the Louvre. Gerard Dow (b. 1613, d. 1680) was the pupil of Rembrandt, from whom he gained a thorough knowledge of light and shade, and a feeling for general effect which preserved his elaborate execution from all tediumness, while he secured to his works a truthful reality in the forms and colors which he delighted to paint. Indeed, none of his pictures, as in that of the Dropical Lady, there is great pathos. Gabriel Metsu (b. 1615, d. 1658) was the best imitator of Terburg. Franz Miera, a scholar of Ger- ziel, Jan van Huysum (1682-1749), equaled him and afforded his master incomparable finish, but not in genuine feeling. Caspar Netscher (b. 1639, d. 1654) and Eglon van der Neer (b. 1643, d. 1703) painted in the same style. The interiors of Peter van Hooghe (b. 1659, d. 1722) are remarkable for magical effects of light. The portraits of Grinling Gibbons (b. 1653, d. 1730) are admirable in landscape. Annibale Carracci and Domeni- chino have left excellent pictures in this department. But as the ugliness of the country stimulated its natives to study all the aids which make an ordinary scene picturesque, it was in Holland that landscape painting was most cultivated. In the school of Van Eyck, the back- grounds are often elaborately imitated from nature: Joachim Patenier (b. 1487) and Hieron van Roes (b. 1480, d. 1539) executed works in which the landscape claims an independ- ent completeness. But the Dutchmen have become more serious. John Breugel, or ‘Velvet-Breugel’ (b. 1665, d. 1625), copied with wonderful minuteness all the variety of vegetation. Contemporary with Annibale Carracci there lived at Rome a Flemish artist, Paul Bril (b. 1564, d. 1626), who showed a keen eye for the link between the landscape painters of the north and south. In that kind of landscape the excellence of which consists in grandeur and the form of the large masses, Nicolas Poussin led the way. He was followed by Gaspar Dughet or Dughet (d. 1665), and Simon Vouet (b. 1616, d. 1670), who was a pupil of Poussin. Both (b. 1610, d. 1651) and Adam Pynacker (b. 1621, d. 1673) were painters of the same character. The Dutch landscape painters kept closer to Northern nature: such are the works of John van Goyen (b. 1596, d. 1656); generally low and rounded, they are painted in a brown, somber tone. Anthony Waterlow (b. 1618, d. 1660) is better known by his admirable etchings than by his pictures. The genius of Rembrandt exercised considerable influence over landscape. But the leaders of this particular school were two, known as Maestro Rogo (1443) and Jan Mudertt Hubbema (b. 1611). The best works of these masters carry us into the depth of the forest and convey that sort of lonely feeling which retold woodland scenery imparts. Albert Durland (b. 1621, d. 1675) gave his pictures more of the Roman character, and often painted waterfalls and pine-forests. We have said nothing of the pastoral side of landscape, in which Nicolas Berghem (b. 1624, d. 1683), Albert Cuyp (b. 1600, d. 1661), Ruysdael (b. 1628, d. 1682), and Adrian van Uylenburgh (b. 1639, d. 1702), excelled. Philip van D框架协议 (b. 1660, d. 1678) pursued a line peculiar almost to himself, or in which at least he has no rival. He executed battles, fairs, halls of cavalry, and all scenes in which horses display their true worth. The most eminent marine painters were Bonaventura Peters (b. 1614, d. 1652), Ludolf Backhuyzen (b. 1631, d. 1709), and William van der Velde (b. 1610, d. 1693). Franz Snitlers (1675, d. 1685), John Fyt (b. 1623, d. 1700), and John Wooten (b. 1644, d. 1719), painted animals. The first of the three executed large hunting-pieces in conjunction with Rubens. Spanish School.—The Flemish masters, as might be expected, seem to have excited an early influence in Spain, especially two, known as Maestro Rogo (1443) and Juan Flamenco (1496), who are supposed by some to have been Roger van Brugge, a pupil of J. van Eyck, and John Hen- nings. The works of Luis de Morales de Badajoz (d. 1546), show some traces of early Flemish minuteness and hard- ness, with great power of expression, especially in the portraits of Alonso Díaz (b. 1466, d. 1500), Alonso Berruguete (b. 1492, d. 1551), Pedro Campaña, a Fleming by birth (b. 1563, d. 1580), Luis de Vargas (b. 1502, d. 1568), and Vicente Jusa (b. 1480, d. 1529), were the earlier Spanish masters of eminence who studied in Italy. The works of Rincon are rare: there is an altar-piece of his at Robledo de Chavela, not far from the Escorial. Campana’s Descent from the Cross, and the celebrated Gamba of St. Vincent on the altar of Seville. The scenes of the Martyrdom of St. Stephen, by Janone, is in the museum of Madrid. Alonso Sanchez Coello (b. 1590) and Juan Fernandez Navarrete el Mudo (b. 1584, d. 1657) painted respectively portraits and sacred subjects for Philip the Third. Coello’s style is very fine, and resembles that of the Venetian school. In the school of Seville, in the seventeenth century, the principal forerunners of Murillo were Juan de las Rivas (b. 1658, d. 1673), whose finest picture is perhaps the Descent of St. Isidore, in the church of Seville. Among the school of the two Herreras, and Francisco Zurbaran (b. 1599, d. 1668), the elder Herrera (b. 1576, d. 1646) is distinguished by vigour and boldness of execution. Zurbaran’s great work of St. Thomas of Aquino, formerly in the Colegio de San Jeronimo and now in the church of San Ildefonso, is the work of his master. Bartolomé Esteban Murillo (b. 1618, d. 1682) has left early pictures at Seville which give little promise of his subsequent excellence. It was only after his return from Madrid in 1645 that he attained that freedom and independence of style which characterizes his later work. Murillo is supposed in this country to stand highest in the Spanish school, but we are of opinion that Diego Velasquez de Silva (b. 1599, d. 1660) was the greater man of the two. His pictures are inimitable: his historical works in the church of Madrid, and such as those at Seville, are second to none in the kind, and are among the best sketches of landscape in the same collection, are of great excellence. One of his most celebrated early pictures is The Water-carrier, now at Apsey House. Alonso Cano of Granada (b. 1600, d. 1667) painted with a fine feeling of simplicity and beauty. Francisco Ribalta (b. 1551, d. 1628) is generally held to be the best master of the Valencian school. The altar-piece in the chapel of Mar- dalen College, Oxford, is probably by him. Claudia Ceol (b. 1635) is one of the best Spanish masters who deserve notice. His pictures in the society of the English hermits are of the highest order. French School.—Leonardo, Andrea del Sarto, Rosso, and Primaticcio were among the Italians whom the zeal of Francis I. introduced into France; but we find little indepen- dent work of a limited kind, and of that resulting from the classical correctness of Racine’s tragedies. Gaspar Poussin and Claude Lorrain have been already named. The best of Vouet’s scholars was Eustache Le Sueur (b. 1617, d. 1655) Peter Mignard (b. 1610, d. 1693) and Charles Le Brun (b. 1619, d. 1703), were pupils of Poussin. The portraits of the former are good: the large pictures of Le- brun were disfigured by the affectation of the time of Louis XIV. Antoine Watteau was born in 1684, and died in 1721. Joseph Vernet (b. 1711, d. 1789) executed some beautiful landscapes, which are considered to be the best of the period. Jean-Baptiste-Siméon Chardin (b. 1699, d. 1779) excelled in the representation of scenes of domestic life. In later times, Jacques Louis David (b. 1748, d. 1825) carried out on a larger scale the principles of Poussin. It is impossible to deny that pictures are the merit of fine drawing and a certain power; but this, without the richness of the theatrical expression, and academic affectation, mar the effect of their better qualities. His most eminent followers were Girard, Gros, Girodet, Guerin, and Géminal. To the last generation of French painters, Dagonet, Oliver, and Cooper, in the reign of Charles I., we cannot

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same an English artist of any eminence until we arrive at Hogarth (b. 1697, d. 1764); for his father-in-law Sir James Thornhill hardly deserves notice. The reader will find a more detailed account of Hogarth in the article which bears his name. No imitator has at all rivalled his peculiar excellence. Boydell's Shakespere Gallery certainly roused a feeling for art and contributed to the spirit which prevailed in England at the end of the last century. Sir Joshua Reynolds (b. 1723, d. 1792) still remains the first on the list of English portrait-painters. His historical pictures are of very inferior merit. No portrait was perhaps ever painted which has been more admired for its originality than that of Lord Heathfield. Many of his female portraits are equally successful. His colour was excellent, though not always lasting. George Romney (b. 1754, d. 1802) has left some works which almost rival Reynolds. The productions of Richard Wilson (b. 1714, d. 1782) do not make us feel more strongly the mannered uniformity and coldness of his later pictures. James Barry (b. 1741, d. 1806) had at least the merit of daring to undertake a work of the greatest magnitude. John Opie (b. 1761, d. 1807) was one of our most powerful masters, and centuries to his portrait of Nelson (b. 1754, d. 1792) and Gainsborough (b. 1727, d. 1788) must be looked on as the founders of the English school of landscape-painting. We cannot but lament that the Raphaellessque purity of Stockhard's early designs was afterwards exaggerated by the school of Reynolds; Reynolds himself was not without reason to deny poetical imagination and grandeur to Fuseli, though these qualities are obscured by overcharged and mannered drawing.

Our own day Lawrence executed portraits inferior only to those of Reynolds; but they possess rather more of the conventional tone of the fashion of the time in which the artist lived than is found in the best works of Sir Joshua Reynolds.

It remains to look round and see what is the promise of European art at the present time. In Italy and in Spain little has been done in this century. The influence of the school of David is visible in the works of Camuccini in the former country, and in those of Madrazo and Aparicio in the latter. A country which has produced so much of our own art since the last century has still much to bring about these results. In Germany a new era has commenced. We have passed too rapidly over the ground to notice Oeser (b. 1717, d. 1799), Raphael Mengs (b. 1728, d. 1779), Angelica Kaufmann, and others; but at the present moment the schools of Düsseldorf and Munich are producing works whose celebrity will be lasting. Fresco-painting has started into life again with fresh vigour in the latter capital. In Overbeck, who resides at Rome, we find the purity and beauty of the Umbrian school renewed. Cornelius, Janssens, and Tischbein, and such as they, have worked most successfully under the patronage of the king of Bavaria. At Düsseldorf, Lessing and Bendemann are two very distinguished artists, and painters of considerable eminence are not wanting at Berlin. Among modern French painters, the best is that of Horace Vernet: hold a high place. Leopold Robert is celebrated for his scenes of Italian rural life, Granet for his interiors, Gudin and Isabey for their sea-pieces. Delaroch and Eugène Deveria are traiors to the principles of David, and may be considered as the chief of a romantic school of French historical painting.

In England there is, as there ever has been, little demand for large historical works. Yet at the present moment no powerful and vigorous hand is more perfectly wedded to the art than that of Lawrence. The earlier works of Wilkie are well known; to our eye there is in his later pictures a slightness and want of substance which is not compensated for by their facility of execution. Leslie and Mullready deservedly possess a high reputation in the direction of their art when it is ready for use, and, inclined to abandon. Etty's colour and form are so fine that we regret the frequent absence of chaste feeling and the predominance of academical display. The characteristic excellence of Eastlake's pictures may be said to be the perfect union of a character and a highly cultivated mind, deeply imbued with the feeling of the older masters. The same refinement is visible in the exquisite landscapes of Calzott. No genius was ever more various that that shown by Turner. The gloomy grandeur and sublime of a landscape of Nicolas Poussin, contrasts singularly enough with the gorgeousness of the Rise of Carthage or the Italy. Without pretending to defend some of his extravagances of colour, it must be remembered that many pictures of Turner's, which now appear sober, were too gaudy for the public taste when they were painted, and only obtained gradually the rank which they hold at the present day.

As a painter of animals, Edwin Landseer far surpasses any of the old masters, and stands unrivalled for softness, life of touch, and wonderful expression of character. One remarkable feature in modern English art is the high class of works executed in water-colours.

(Müller, Handbuch der Kunst; Sillig, Catalogus Artieum; Vaasen, Picta dei Pitori; Lanzi, Storia Pictorica; Dumortier, Italienische Künstler; Fugger, Handbuch der Geschichte der Malerei; Warburg, Kunstwandel und Künstler in England und Paris; Cean Bermudes, Diccionario de las Bellas Artes; Passavant, Kunstreise durch England und Belgien; Fittington's Dictionary of Painters.)

PAINTING, HOUSE, is the art of painting the interior and exterior of our dwellings and other buildings with a composition which shall preserve from decay, please the eye, and render the surfaces to which it is applied less liable to soil and easier to be cleaned. It is executed either in oil or distemper.

In oil the principal tools employed are brushes made of hog's bristles for large surfaces, and sash-tools made of finer hair for small work, as mouldings, window-bars, &c. After being used, they are kept in water to prevent their getting hard.

White lead is used for white colour; it is also the basis of all ordinary colours. The colouring substances (stainers) of general use are: earth, umbre, ochre, Sienna, Venetian red, purple, brown, &c.; the first two being burnt, a process which reddens and darkens them. Metallic compouds are red lead, vermilion, Prussian blue, chrome yellow, verdigris, Brunswick green, verditer, &c.

Animal and vegetable colours are lapis, indigo, ivory black, and lampblack.

All these require to be ground very fine in oil. This tedious and uneconomic process was formerly performed by hand, and by painters for their own use, but now the manufacturing chemists are enabled, by the application of machinery, to supply the articles cheaper than they can be prepared at home; and the painter, being relieved from this troublesome part of his business, will, if he aim at excellence in his profession, turn his attention to the higher branches of his art, and study the laws by which colours are related to each other, so as to be able to harmonise or contrast them as occasion may require.

The liquids in use are linseed oil (sometimes boiled with lintharge to render it drying, and hence called boiled oil), and lintharge or spirits of turpentine, the latter being chiefly used for the purposes of mixing oil colours, and for thinning the paint for the purpose of use in various proportions according to circumstances: when the paint is required to bear a gloss, or is intended for outside work, most oil is used; and for black, State outside work, it is used alone, or with a very little turps, is best. For flatting, which has no gloss, turps alone is requisite. To all paint a little sugar of lead, or latharge (dryers), should be added to make it dry quick. It is important that all surfaces intended to be painted should be thoroughly dry, otherwise the paint will be liable to peel off.

With respect to mixing, the workman takes as much white lead as experience tells him is requisite, and a little oil or turps, and, after these are mixed by stirring with a stiff, then the manufacturing chemists are enabled, by the application of machinery, to supply the articles cheaper than they can be prepared at home; and the painter, being relieved from this troublesome part of his business, will, if he aim at excellence in his profession, turn his attention to the higher branches of his art, and study the laws by which colours are related to each other, so as to be able to harmonise or contrast them as occasion may require.

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coats contain about as much oil as turps, and are termed second colour, third colour, &c.; but the last coat previous to the finishing one is in all cases termed the ground, and is near the colour of the intended finish, except for black ground, and some other coarse dark colours, when the ground is lead-colour, composed of white and black mixed together.

The repainting of old work is the same as new, with the omission of the knotting and priming.

Stone-work, stucco, &c. are treated in the same way. It is generally necessary to repeat the coats, allowing sufficient time between each to dry, till the work ceases to absorb, which is known by the absence of dull spots and patches. It is also the practice to omit turps in mixing cold colours, which are finely dry before they are used. As in graining, the methods, tools, and materials adopted in this art vary with almost every workman, and it would be useless to attempt to describe in the processes which are so dependent on the artist's taste, but we may observe that the artist, having received a commission to copy a model and to imitate the dominating colour of the material to be imitated, the grain of wood is generally represented by semi-transparent colours mixed in beer. The subsequent varnishing fixes the colours, imparts a gloss, and defends the work from the weather. Distemper.—The brushes for large surfaces differ from those used in oil: they are wider and flatter, and are termed distemper-brushes; but the tools for small work are similar. Whiting takes the same place in this branch that white lead has in oil; the colours, however, are similar, but ground in water, and the fluids are water and melted size.

Mixing.—The whiting having been reduced to a stiff paste with water in which alum has been dissolved, the colouring matter is added, and the whole thinned with warm size. It must then stand till it gets cold, and it is not fit for use unless it chills, or forms a slight jelly. It is best to strain it after it has chilled, as the colouring substances will come to the top. Before applying on the wood, it must be well cleaned, for if there remains any substance which the fresh applied colour will soften and mix with, the work will not present a uniform appearance, but will be cloudy. The best work is painted first in oil, then flattened, and finally painted in distemper, and it is better that there be one than to paint the distemper can be applied with advantage, for which reason care should be taken to cover every part equally, and particularly that the brush touch no part that is once dry; for this reason several men are employed together, that the work may not be interrupted (except that of a ceiling) may be covered before any part has time to dry.

It is a generally received opinion among painters that white lead is the best material for painting work of all descriptions, with a view to its preservation, and they affirm that black grounds have the property of increasing the durability of paint depends on the insolubility of the materials used in its composition, we might infer that black, which is composed of one of the most imperishable bodies known, namely carbon, in the state of lampblack, is more durable than any other. Other grounds, in which not only the substance slightly soluble in water, and the following facts confirm this. To be able to judge fairly, we must have black and white of the same age equally exposed, and on the same material. These conditions are all fulfilled on finger-posts and other public notices exposed by the highways and on wooden grave-rails in country churchyards, which are almost invariably painted and written either black and white or black and white. Those with black grounds and had not been repainted in his infancy, and the illegible remains of the inscriptions while the ground is quite perfect. But the black writing frequently remains not merely till the white ground is washed away, but often till the surface of the wood, except where the object which it is occupied by the legibility of any kind: the depth of a small groove or of an inch, actually leaving the inscription in relief; and although most general rules are said to have exceptions, the writer has never met with one to this.

PAISIELLO, GIUSEPPE [Giovanni].—Paisiello, Giovanni, was born at Taranto in 1741, and entered at an early age in the Jesuit's College of that city, where he manifested so strong a disposition for music, that his father, an eminent veterinary surgeon in the service of Charles III., prevailed on to place his son in the Conservatorio di Musica at Naples, in which he was admitted in 1764, and during the following five years pursued his studies under the celebrated Durante. He there produced, among other compositions, a comic interlude, which at length became known in Italy, and in 1743 he was engaged to write an interlude for the Teatro di Marsigli at Bologna. From that period the commencement of his professional career is to be dated, and it continued with undeviating success, till burned by approaching age, he wisely determined to relinquish his most active occupation, and to rest at least in case his well-earned honours and moderate independence.

Paisiello's reputation was speedily established, and he soon accepted engagements to compose operas for every great city in Italy; in consequence of which he produced at least twenty, forming a part of which was consist of a group of which of course only enjoyed a short-lived triumph. In 1776 he entered into the service of Catherine II., and continued in Russia nine years, where he composed several operas, among which was his Barberie di Slegia; also an opera for him an opera for an opera for which he produced in Vienna, at the desire of Joseph II., Das Re Tornado, and La Molina; and for the same monarch wrote twelve symphonies.

On his return to Naples the king invited him his maestro di camera in the court, and settled him on a pension of 3000 ducats. The king of Prussia now wished him to visit Berlin, and the empress of Russia was desirous of his return to St. Petersburg, but he declined both engagements, as well as an invitation to London; but he composed for the King's Theatre in the same city the opera, which was performed at Naples under the title of Il Fanatico in Berlin. On the death of the French general Hoche, he produced a funeral symphony, for which he received a handsome present from Bonaparte; and about the same time brought out his Zingari in France.

The revolution at Naples, in 1799, gave to that country a republican government, under which Paisiello accepted the office of National Director of Music; but at the restoration of the royal family he returned to Naples, and was never able to retain his position, and was suspended from all his public functions. In about two years however his services were found to be indispensable, and he was reinstated. Shortly after this he accepted an invitation from Bonaparte, then First Consul of France, to visit that country, and was received with the most distinguished manner: a salary of 12,000 francs was assigned to him, and 18,000 more were added for his travelling and incidental expenses; besides which he was offered various high and profitable appointments, but declined them as exempt from the risk and danger of the head of the government. In Paris he produced thirteen masses, motets, &c., a Te Deum for Napoleon's coronation, and an opera, Prosperine, for the Académie de Musique. The air of France not agreeing with his wife's health, Paisiello returned to Naples, but never failed to transmit to the French emperor a sacred composition for the anniversary of his birth.

A second revolution at Naples now placed Joseph Bonaparte on the throne of that kingdom, who confirmed Paisiello's position and rank, and was not without a paragon—withstanding a multitude of those who had been in his service in the first brood. His salary was increased, and, to crown the whole, he was elected an associate of the French Institute. He died at Naples, in 1816. The city rendered him funeral honours, and his Coffin was given at the great theatre on the evening of his death, and the king and the whole court attending the performance.

"Paisiello," says the Chevalier Le Sueur, "was not only a great musician; he possessed a large fund of information, was well versed in the dead languages, and conversant in all the principal branches of modern and of the schools of Germany—they are never deficient in pathos, they abound in tenderness, and are invariably characterised by truth of expression—by the admirable judgment with which the sentiments of the past are illustrated: and as a melodist, he is without a rival: signs are almost as numerous and as inimitable as that might be cited, his "Nel cor piu non mi sento,"
and 'To sum' Lindon (or, 'Hope told a flattering Tale', and 'For Tenderness form'd'), which are known, and will for ever be known, in every corner of the world where European arts are cultivated. And though his operas, Elifreda, Pirro, il Barbieri di Siviglia, La Moahirna, Nina, &c. are eclipsed by the grander and certainly more complete instruments, of the different orders, and are published with additional accompaniments and skilful management, they might now be brought out successfully, and, thus re- novoed, would be admitted to have lost none of those charms which beautiful air must always possess, and by which the last part of the last century, and is now used in a pan-chit. The style is chiefly Gothic. No part is supposed to be earlier than the middle of the fourteenth century, as in the year 1307, during the wars of the Succession, the monastery is said to have been wholly destroyed. The abbey of Paisley was the family burial-place of the Stewarts, before their accession to the Scottish throne, and since then Robert III. and Euphems, the wife of Robert II., were interred here. The registry or chartered of the abbey was published by the Glasgow Mailand Club in 1832. The other churches of the establishment are, the High Church (built in 1746), the Middle Church (1781), and St. George's (1819), the ministers of which receive 300£ per annum each. Besides these, there are the Gaelic chapel and a great many other places of worship. Paisley is a particulars of Glasgow and Ayr. The burgh and new town are united by three stone bridges, each of two arches. Between two of these, the old and Sneddon bridges, and on the western bank, is situated the castle or county- house, a fine stone-building erected in 1810, and comprising a court-house, council-chamber, and other offices, a debtor's prison, another for criminals, together with a bridewell and chapel. The police of the town and suburbs is regulated by an act passed in 1765.

Under the act 3 & 4 Will. IV. cap. 77, the magistracy consists of sixteen councillors, including a provost, four bailies, and a treasurer, one-third of whom retire from office annually. The ancient boundaries of the burgh are more restricted than were the prescriptive, since the municipal boundaries, which include about six square miles, and comprise a large agricultural district. The property of the corporation, in 1833, was estimated at 56,120£. The income during the same year was 383£, and the expenditure 373£. The annual revenue of the corporation, which amounted to 10,000£, had increased in 1833 to 33,000£. This increase is attributed to the outlay attending the many public works undertaken during the intervening period. Among the earlier works undertaken by the corporation is the improvement of the Clyde, which was partly done at the expense of the local act passed in the year 1787, authorising the council to levy tonnage dues for that purpose. The bed of the river was considerably deepened, except near Inchninnan Bridge, where it was deemed advisable to continue the course of the river above and below that bridge by means of a canal which crosses the turnpike road leading from Greenock to Glasgow, and which was completed in 1791. The Cart is now navigable up to the town for vessels of from 60 to 80 tons burden. The navigation of the Clyde, and the cost of which already amounts to 130,000£, but which as yet does not extend in a westerly direction beyond the populous village of Johnstone, crosses the Cart water by an aqueduct bridge on the southern side of the town. A railway was also projected to a station at the mouth of the Clyde, a little above the mouth of the Cart; and an act of parliament has lately been obtained for constructing a branch of the Forth and Clyde Canal to terminate nearly opposite to this station. In 1767 the principal articles made in the town were coarse linen, chequered cloths, and Bengal, to which succeeded chequered linen handkerchiefs, and goods of a lighter texture, such as lawns. About 1752 the machinery for making white sewing cotton was introduced. Of the establishment in 1770 the manufacture of silk gauze was introduced upon the plan practised by the Spitalfields houses, and, during the greater part of the following thirty years, was carried on upon a very extensive scale. The competition between the London and Paisley manufacturers of silk, and any of the former to relinquish altogether the manufacture of this article. Others removed their establishments to Scotland. The reduction in the cost of cotton goods, consequent upon the invention of Arkright's spinning-machines, lessened the demand for Paisley goods, the manufacture of which at Paisley has since then greatly declined.

In 1784, when the linen trade was more prosperous than it has ever been, either before or since, the value of the Paisley, Coarse linen, Chequered cloths, and Bengal, was estimated at 575,185£: their value in 1790 was 660,385£. Since 1823 a great number of hands have been employed in the
manufacture of ope dress, and damask and embroidered
shawls, in imitation of those imported from China. The
gross amount of the shawls sold in 1834 was estimated at
one million sterling, which was less than in some of the
preceeding years. Mr. Henry's occupation, and establishment in the
town, was now exclusively engaged in the various branches of the
cotton manufacture, among which the muslin branch
may be particularly mentioned as that of which Paisley
is regarded as the chief seat. A considerable portion of the
yards of Paris appearance were imported from Paisley and
muslins imported from Manchester. The number of looms in the town
in 1837 was ascertained to be about 6000, of which 3000 were
worked by Glasgow houses. Besides these about 2000
looms were employed in the country by Paisley capital.
The price of weavers at the same time was 6040.
There are also a large iron and three brass foundries, one
tan-work, three breweries, three distilleries, one large soap-
work, seven extensive bleach-fields, one large silk-throwing
mill, &c.

Since the passing of the Scotch Reform Act in 1832,
Paisley has returned one member to the British parliament.
The boundaries of the parliamentary borough comprise four
parishes, whose aggregate population, in 1831, was
25,466, and was distributed among 12,988 families, of whom
nine-tenths are employed in the cotton manufactu-
tures. These parishes were, Paisley Abbey (population 26,000),
High Church (14,621), Low Church (6955), Middle
Church (3864), which, with five others, constitute what
pairs, and form the parishes of the new town and suburbs of Paisley and Johnstone, which contain
respectively 14,739 and 5617 inhabitants, are included in the
return of Paisley Abbey parish. The other three
parishes, and these only, are within the corporate liberties. A
considerable portion of the inhabitants are Irish, whose
immigration materially contributed to the increase of the
population during the ten years preceding 1831. This
increase amounted to 5032 persons in the three corporate
parishes, and 5431 persons in the new town. The local
taxes levied within the corporate liberties amount
an average of ten years, to 3093£. of which the sum of
2096£ is raised on account of the poor. From these
taxes the inhabitants of the new town are entirely exempted,
as well as from certain charges paid by those who carry on business "within the burgh." Although Renfrew is the county
town, Paisley has long been the seat of the sheriff's
or county court. In 1815 an additional sheriff's court was
established at Greenock, and since then the county
has been divided into two districts, called the upper and lower
wards, the former of which is annexed to the court of
Paisley.

There is a weekly market on Thursday, and four fairs,
each of three days' duration, which are held in February, May, August, and November. The
three annual fairs were originally established by charter of Charles II
granted in 1665.

In 1834 there were three parochial and fourteen non-
parochial schools in the parish of Middle Church. The
greatest number of children which attended the fourteen
non-parochial schools during the half year ending with
Lady-day, 1834, was 157 boys and 396 girls; the least
number during the same period was 125 boys and 336 girls.
The High Church parish, where there were no parochial schools, but the same number (fourteen) of non-parochial, the
greatest number of children was 888 boys and 751 girls,
and the least number 685 boys and 493 girls. One of these
was a charity school, wherein 150 day and 100 evening
pupils were formerly taught. In Low Church parish there
was a day school. The average number of children in
six in number, none of which were parochial, were attended
by 55 children, including evening classes. In Paisley
Abbey parish there were thirty-one schools, entirely non-
parochial. The greatest number of children in 1832 was 1265
boys, 782 girls; the least number is not stated.
In a district of the parish of High Church, containing
a population of 1047 persons, there were 46 children
between the ages of 5 and 10 who could not read and were
not at school; 96 between the ages of 10 and 15 who could
not write; 18 above the age of 15 who could neither read
nor write; and there were 96 children at school. The
above returns do not include Sunday-schools, which were
attended by more than 1300 children. The number in
1845 was 4196. (New Stat. Soc.) It was remarked by the
Commissioners, from whose Report these numbers are taken,
that of the families employed in factories, a greater
proportion of the children were attending school than of
the families of weavers and labourers. Since the date of the
Commissioners' Report the school has been opened, an
endowed school has been established, and a government
grant of 700L, augmented by the subscriptions of the
inhabitants, has afforded the means of erecting three new
school-rooms and enlarging an old one. About three years
ago a new public school was opened, and funds were
instituting a school for the middle and higher classes, to
be called the "Paisley Academy." There are within the
45 friendly societies, numbering from 120 to 800 members
each, and of which are supported and conducted ex-
tensively. The people in general, it was stated to have
succeeded remarkably well. The "Paisley
Provost Bank," was established in 1815. Its receipts for
the year ending October 30, 1836, amounted to 4500L.
There is a public dispensary, an infirmary, a mechanics'
institution, and several subscription libraries. (Reports on Scotch Municipalities, 1836; Abstract
of Report on the state of Education in Scotland, 1837, xlviii,
p. 629-31, and other Parliamentary Papers; Chalmers' Caled-
odia; Camden's Britannia; Penman's Tour in Scotland;
Crawford's Renfrewshire, edited by Robertson, 4to., Paisley,
1818; New Statistical Account of Scotland; &c.)
PAILAIR. [Hindustan, vol. xii, p. 208.]

PAILLEY. The most important languages from the Latin Palatium, the name given by Augustus to
his residence on the Mons Palatium at Rome. In its
stricter meaning it is restricted to a royal abode, but is
casionally applied to any sumptuous habitation. In Italy
the term Palatium, or Palatine, is applied to any largem
or nobleman's house; and palaces of this class constitute,
after churches, the principal architectural features of Genoa,
Florence, Rome, Milan, Vicenza, Venice, and other cities,
to which they impart an air of grandeur which is wanting in
the smaller palaces. Many palaces have been pulled down
or destroyed; others have been altered in point of time;
and the grandest and most beautiful have been made to play a
less distinguished role in the social life of the country than
these.
very little, certainly not enough to reconcile us to the pro-
digal execution of so very indifferent a design. The royal
palace at Stockholm is a stately edifice in the Italian style,
though the original design, by Count Tessin, was consider-
ably curtailed. The eastern or winter-palace at Petersburg
was a vast pile erected by the Italian architect
Rastrelli in the reign of the empress Elizabeth, of most
imposing aspect towards the quay of the Neva, but exceed-
ingly heavy and grotesque as to style. This structure, or
at least its principal part, by are in the fire of 1780, the
same year as the Singing of 1838, but has since been rebuilt,
though we do not know whether according to an entirely fresh design.
The Neue Residenz and Königsbau at Munich have already
been spoken of elsewhere. [MINUSC.
Palermo was a city which depended upon many of these
edifices, every one of them falls very short of the ideal
of a royal palace, in which, if anywhere, not only all the
luxury and pomp of architecture, but a certain colossal
dignity of aspect should present itself. This can never be
accomplished where stories above stories are allowed to
display themselves externally. That is but a vulgar species
of architectural grandeur which is produced by a numerical
multiplication of little parts and features. All the rooms
required for the apartments of a domestic 'con
could be turned towards inner courts, and the whole ex-
terior, having only a single range of lofty windows above the
ground-floor, should be left for the unreserved display of
architecture, and sculpture upon a noble scale, without any
interception or interruption by a single door. The absence of
these would perhaps be found far better consulted than
at present, because, while all the apartments for official and
state receptions and court entertainments would be con-
nceted together, the whole of the vast number of subordinate
rooms would be lost in the gloom of the interior and
together within the general plan, and at the same time might be
kept entirely apart, by means of galleries between the outer
and inner range, communicating at intervals with lesser
vestibules and staircases attached to the suites of lesser
rooms. What good Roger of Palermo's 'Palmlography' may also
be seen in his description.
PALE'ADース. [TOLIOTHES.]
PALEMON, the generic name for the Prouns.
[SHRIMP.
PALEMONIANS, or PALE'MONIΔE, a Phœnian tribe.
[SIRIUS.
PALEOGRAPHY. The study of ancient documents,
called by modern antiquaries 'Palographia,' is too exten-
sive a subject to be canvassed at length in a work like the
present. We are content to confer upon it a place in this
work, as an essential ingredient in the study of all
ancient documents. The works of Walch on 'Elements of
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PALEMONIANS, or PALE'MONIΔE, a Phœnian tribe.
[SIRIUS.
James's, and possesses curious articles in almost every branch of literature.


It contains 299 volumes of manuscripts; among which are five manuscripts of the gospels in the original Greek, of the eleventh, thirteenth, and fourteenth centuries; copies of commentaries upon the scriptures, both in Greek and Latin; and manuscripts of different kinds and of very large and valuable works of the Greek and Latin fathers. But the most important portion of the collection consists of manuscripts of the classical authors. Of these, the celebrated manuscript of the 'Iliad' of Homer, formerly belonging to Master H. T. Townley, is justly entitled to the first place in estimation. Though probably not older than the latter part of the thirteenth century, it is one of the earliest complete manuscripts of the 'Iliad,' and is particularly valuable, both on account of the correctness of its text and also of the copious scholia with which it is illustrated. Two copies of the Greek orators likewise deserve especial notice; one of them, written upon vellum, is perhaps the most important manuscript extant of these authors; it yields many valuable readings, and supplies, besides smaller leceme, portions of the 'Apostolic' and 'Church History' of Eusebius, 'The History of Alexander,' and a very fine copy of the mathematical collections of Pappus Alexandrinus, which formerly belonged to Baroci.


This collection is rich in materials for the history of our own country and language, having no less than seven copies of the 'Historia Britonum' of Geoffrey of Monmouth, copies of the 'Annales' of the Bishops of Hereford, of Huntingdon, Ralph Higlen, Roger de Hoveden, William of Malmesbury, Nicolas Trivet, and others. It has also a recent but unique manuscript of Ingulph's 'Descriptio Abbatis Croylandensis,' and a volume of letters and other documents relative to the diocese of Henry VIII. from the archives of Aragon, among which are original. There are also chartularies of the Abbey of St. Alban's, of the hospital without the Southgate at Bury St. Edmunds, of the monastery of St. John at Colchester, of the abbey of Sibton and Tintern, of the monasteries of St. Albans, and of the church of Camelot. There are also chartularies of the abbey of St. Mary and St. Margaret, Dartford, of the abbey of Glastonbury, and of that of Newenham in Devonshire. We may also mention a curious volume entitled 'Aerlynte,' composed in the Kentish dialect of that period, which will shortly be published by Mr. Wright; and a large number of volumes on jurisprudence, comprising the 'Digesta' and Codex of Justinian, the 'Decretum' of Gratian, and the 'Intrumenta,' fol. Dunk., XII., and Boniface VIII., with numerous glosses, commentaries, dissertations, texts, summaries, and collections of decisions, cases, and opinions.


These are deposited for general use in the reading-room of the Museum.

Other Libraries in Great Britain.—We possess the following printed catalogues:


7. Catalogus sive Notitia Manuscriptorum, qui à G. D. Clarke, comparati in Bibliotheca Bodleiana deservunt, 4to., Oxon, 1812.

8. Principally classical.


This collection is in the Bodleian Library.


We must here notice the splendid library of Sir Thomas Philipps, Bart., at Middle Hill, Worcestershire, who possesses the largest known private collection of manuscripts and charts, some of which are of the greatest rarity and importance. A slight catalogue of a portion of these has been privately printed by the learned possessor at his own private press, and this has been copied into Haenel's compilation. The Earl of Leicester at Holkham possesses a valuable collection, of which a brief account has appeared in the 'Transactions of the Royal Society of Literature.' Dr. O'Connor prepared a catalogue of the MSS. at Stowe, the seat of the Duke of Buckingham, which was privately printed in 1818, in two volumes 4to.

Considerable numbers of MSS. are likewise preserved in the Library of the British Museum, in the Library of the Duke of Devonshire, and in various places, by far too numerous for us to attempt even a bare outline; we give however a slight list of the documents preserved in the Tower of London, with the hope that it will prove useful to the antiquary and historian.

1. Negotiae et fideis cum principibus extraneis.

2. Gentis hujus atque populi praelo res gestae in Gal- lia alicubi regionibus transmarinis.

3. Historiae et servitut, in quibus Scotia ab Anglia pendent.

4. Hibernia in legibus et dominiosis constitutis.

5. Dominium Mariam Britanniorum, Gallos Bataevoce.

6. Fiscationem in predictis maribus prohibebus, nisi venia prae a Regibus Angliae imperio, generali prescriptione comprobatum.

7. De rebus Walliae, ac etiam compotis reditum Principis Walliae.


11. Libertates atque privilegia, concessa urbibus oppidi- que corporis, vel personis privatis, uti letas, mercata, feras, communia partures, waives, extrahere, felonum bona, pos- tagium, &c., et quicquid aliud ad eum regnum perventurum est, vel eo ex proventorem.

12. Coronationes regum Anglie, cum particularibus tenurias et clamea singularium qui dictis coronationibus in serino tenetur, una cum ordine et ratione processiones.


15. Fundationes abbatiarum et prioratum, aliarumque saldi religiosarum in Anglia, Wallia, Gallia, et Hibernia, una cum singularum ordinibus, terraeque et possessionibus iidem donatis.


17. Inspeczium et irrotulaciones chartarum et munimen- torum, tam ante quam post Conquestum concessorum.

18. Testamentes multarum evidentiariae et contractuum


20. Constitutiones plurimarum superiorum regiae Anglie et Hibernie.
The Age of Manuscripts. — There are several criteria whereby we are enabled to judge of the age of manuscripts, but it requires much practice before a really correct opinion can be formed upon a given; and so much depends upon a personal examination of a large number of all ages, that no infallible rules can be given on the subject. We refer the student to Wallis's 'Palaeography.'

The books principally made use of in the preceding slight sketch, which belong to the English limestones, are all universally straited or sculptured. We find a few exceptions to this rule, as at Burdihouses, and at Ardwick near Manchester, but it rests on a considerable number of coincidences. It is an unexpected result of Agassiz's critical inquiry into the forms of fossil fishes, that the Palaeoniscii of the English magnesium limestone are not identical with those of the zeichstein of Germany, notwithstanding the supposed contemporaneity of the rocks. Gaspary [Ptytacidae.]

PALAEOSAURUS, the name given by Dr. Riley and Mr. Samuel Stutchbury to a genus of fossil Saurians discovered in the magnesian conglomerate on Durham Down, near Bristol (1834). The conglomerate wherein the Saurian remains were found rests upon the edge of inclined strata of mountain limestone, filling up the irregularities of their surface, and consists of angular fragments of the limestone cemented by a dolomite paste. The thickness of the deposit where the remains were discovered does not exceed twenty feet.

Three animals were found, two belonging to the genus Palæosaurus, and the other to a genus named by them Thecodontosaurus. [Thecodontosaurus.]

Generic Character of Palæosaurus. — Teeth carinated laterally, and finely serrated at right angles to the axis, differing from those of all the known Saurians.

Species. — The teeth in the possession of the authors exhibit minor marked characters, and they have accordingly considered them as belonging to two species, Palæosaurus cylindricus and P. platyrhynchus. [Gol. Proc. 1834.]

PALÆOTHÆR'RIUM, Cuvier's name for an extinct genus of Pachydermata Herbiceora discovered in the gypsum beds at Paris in company with Anoptotherium. [Ancyrotherium.] The discovery and definition of these and other Pachydermic forms, now utterly swept away from the face of the globe, form one of the noblest triumphs of the great French zoologist, who, from confused fragments huddled together peil-meil, separated the different bones, and, so to speak, built up the skeletons of the lost animals, till their osseous structure and place in the chain of created beings became as well known as those of the animals that dwell upon the earth at the present day. It is not easy, says Dr. Buckland (Briggswater Treatise), 'to find a more eloquent and striking acknowledgment of the regularity and constancy of the systematic constrictures that pervade the animal remains of the fossil world, than is contained in Cuvier's introduction to his account of the bones discovered in the gypsum quarries of the neighbourhood of Paris. It affords, to persons acquainted with
the modern method of conducting physical researches, an example of the kind of evidence on which we found our conclusions as to the form, character, and habits of extinct creatures that are known only through the medium of their fossil remains."

The striking passage alluded to by Dr. Buckland, after stating by what slow degrees the Parisian cabinets had been filled with innumerable fragments of bones of unknown animals from the quarries of Montmartre, thus describes the mode in which Cuvier worked out the task of reconstructing their skeletons. He had already ascertained that there were numerous species belonging to many genera; and we shall now let this prince of comparative anatomists speak in his own person. "I at length found myself, as if placed in a charnel-house, surrounded by mutilated fragments of many hundred skeletons of more than twenty kinds of animals piled confusedly around me; the task assigned to me was to restore them all to their original position. At the voice of comparative anatomy every bone and fragment of a bone resumed its place. I cannot find words to express the pleasure I experienced in seeing, when I discovered one character, how all the consequences which I predicted from it were successively confirmed. The facts accorded with the characters announced by the teeth; the teeth were in harmony with those previously indicated by the feet. The bones of the legs and thighs and every connecting portion of the extremities was found; and it has been proved that I had arranged them before my conjectures were verified by the discovery of the parts entire. Each species was in short reconstructed from a single unit of its component elements."

**Generic Character of Palæotherium.—Dental formula:**

Incisors | Canines | Molars
--- | --- | ---
6 | 1-1 | 7-7

Three toes on each foot. A short fleshy proboscis, for the attachment of the muscles of which the bones of the nose were shortened, leaving below them a deep notch.

The molar teeth bear considerable resemblance to those of the Rhinoceros: in the structure of that part of the skull destined to support the short proboscis and the feet, the animal closely approached the tapir. The species are numerous, and the following have been named:—*Palæotherium magnus* (gymnoped of Montmartre), *P. medium* (gymnoped of Montmartre, osseous brevica, etc.), *P. curvum*, *P. latum*, *P. curvit*, etc. The" specimens of Palæotherium appear to have stood in the same character of strata as the genus Palæotherium, apparently closely allied to the genus Moosch. From the occurrence of the latter fossil, Mr. Pratt infers that a race of animals existed at this geological epoch whose habits required that the surface of the earth should have been in a very different state from that of the present. It is therefore quite possible that the consequence of the frequent discovery of the remains of animals who lived almost entirely in marshes. (Proc. Geol. Soc., 1830.)"

Mr. Owen, in his paper on *Choroptemps* (1854), offered some remarks on the jaw discovered by Mr. Pratt in the Binstead quarries in 1830, and considered by him to be allied to the genus Moosch.* On comparing the jaw with the corresponding part of the *Moosch moschiferus*, which it resembles in size, Mr. Owen found that in the fossil the grinders are relatively broader, that the last molar has the third or posterior tubercle divided by a longitudinal fissure, that the grinding surface is less oblique, and that the coronoid process differs from that of the Moosch and other ruminants, but strongly bespeaks an affinity with the Pachyderms.

Professor Owen further remarked, that among the genera of the Paris basin established by Cuvier, the Dichobune exhibits characters which connect the Pachydermata with the Ruminantia, and thus exhibits new and extraordinary unions of characters which in existing Mammals belong to distinct orders. In the Dichobune the posterior molars begin to exhibit a double series of cusps, of which the external present the crescentic form, so that the teeth of the Dichobune might be mistaken for those of true Ruminantia. In the lower jaw of the Dichobune the antepenultimate and the penultimate grinders have two pairs of cusps, and the last grinder three pairs, of which the posterior are small and almost blended together, so that when looked down they appear single.

In this respect, as well as in the form of the ascending ramus of the lower jaw, Cuvier states, in the 'Ossseros Fossiles,' that the Dichobune 'prodigiously resembles' the young Musk Deer.

Now in respect to Mr. Pratt's specimen, Professor Owen observed, that there is undoubtedly a close resemblance to the Musk Deer, but the differences are sufficiently great to forbid its being placed among the Ruminants, while there is a still nearer resemblance between it and the genus Dichobune. The Isle of Wight specimen appears somewhat larger than the *D. leporinum*, and the ascending ramus differing in form and approaching that of the true Anoplotheria. Mr. Owen considered that it indicated a new species, which, until the form of the antitubercular or second incisors is known, might be referred to the genus Dichobune, under the name of Dichobune cervinum. (Proc. Geol. Soc.)

**Geological Position.**—The geological place of the extinct genus Palæotherium is in the first great fresh-water formation of the Eocene, of which the period of Levallois was found with congenerous, of which nearly fifty extinct species were discovered by Cuvier.

**Zoological Position, Habitat, etc.**—The zoological position of the genus appears to be intermediate between the rhinocerotid and the tapirid. Their teeth do not agree with those of the tapirs. Dr. Buckland is not singular in thinking that these animals lived and died upon the margins of...
the then existing lakes and rivers. He is also of opinion that their dead carcases may have been drifted to the bottom in seasons of flood, and that some perhaps retired into the water to die. The species varied greatly in size, some having been as large as a rhinoceros, and others having ranged from the size of a horse to that of a hog.

Examples, Palaeotherium magnum and Palaeotherium minus.

*Palaeotherium magnum.*—Size of the skull equalling that of the largest horses.

*Palaeotherium minus.*—Size of the skull smaller than that of the roe (Chevreuil).

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**PALEOZOIC SERIES.** The fossiliferous strata of earlier geological date than the carboniferous system, and the mountain limestone, are thus designated in the article Organic Remains. One of the greatest impediments to a clear exposition of geological truths, is the difficulty of choosing proper general terms to suit classifications founded on limited researches. The ancient terms of Primary, Secondary, and Tertiary Rocks will probably retain their popularity and applicability, because of the simplicity of the truly general idea which they contain in common—the sequence of geological time. In characterising and naming the subdivisions of these great groups of rocks, geologists have only partially followed out the same principle; every geological investigation of sufficient extent includes, as a principal point, the discovery of the relative antiquity of the subdivisions of Primary, Secondary, and Tertiary strata, but there is seldom an opportunity to frame a corresponding nomenclature, owing to the circumstance that general names, already and indeed long since proposed and adopted by the great body of geologists, cannot without great inconvenience be changed, even when new discoveries or wider generalizations demand their correction.

The term ‘Transition’ was applied to a large section of the Primary rocks, or else used to designate them as a separate class, at a time when true characters could by no means be assigned to them. Among Transition rocks, *Grauwacke* was frequently seen. Hence the term Grauwacke System was commonly used to express a large portion (the upper) of the Primary series of strata.

In progress of rigorous investigation, the absence of organic fossils from the grauwacke and non-grauwacke rocks, and the occasional or ordinary presence of them in the grauwackes, became generally admitted, and hence the convenient classification of Mr. De la Beche of ‘Fossiliferous’ and ‘Non-fossiliferous’ Primaries, the former being in fact an equivalent term for ‘Transition Strata.’ Recent researches into the organization of the fossil plants and animals of those ancient strata have produced very strong evidence for believing that, from the Snowdonian States, placed by Professor Sedgwick in the lower part of the Cambrian system, to the lower beds of the old red-sandstones (at least), one system of organic life prevails—characterized by the preponderance of corals, such as Catenopora and Favosites, shells of Brachiopoda and Cephalopoda, and crustaces of the trilobite types. It is true that when separate strata, included within the limits of geological time just stated, are compared in respect of their organic contents, distinctions more or less marked appear (as for example, conspicuously in the strata of the Silurian system), yet these mostly turn on nice differences of some of the analogous forms, and may perhaps have only a local value, as we know to be the case in the instance of the oolite strata.

On the contrary, if we compare the whole series of organic forms found in these Palaeozoic Strata, as they are exhibited in Wales or Cumberland, with the whole series of fossils discovered in the carboniferous system of the north of England or the border of Wales, we find not more than 1, 2, or 3 per cent. of intimately related species. The distinction between the Silurian fossils and those of the mountain limestone is of the same order as that which obtains between the latter series and the fossils of the magnesian limestone. Struck with this fact, Mr. Murchison has suggested for the early groups of strata the title of ‘protozoic rocks,’ which (beside one chance of ambiguity from the meaning attached in zoology to the word ‘Protozoa’) seems to assert more than is necessary, perhaps more than is known. We prefer therefore to apply to the same strata the title of Palaeozoic, which seems liable to no objection, and which has, we believe, been occasionally employed by Professor Sedgwick.

Supposing, as we think likely, that general terms for stratified rocks, thus formed upon a consideration of their organic contents, which appear to follow a great law of succession, will be preferred to others based on a view of their mineral qualities, which are certainly subject to repetition, there will be no other difficulty in their construction or application than what may be overcome by the progress of investigation. As many systems or combinations of organic
forms are as clearly traceable in the stratified crust of the globe, so many corresponding terms (as Palaeozoic, Mesozoic, Cainozoic, etc.) they are made, nor necessarily quench any new discovery. For instance, the term Palaeozoic may be retained, though it should be found that the application of it ought to be extended so as to include the carboniferous rocks or even the magnesium limestone (Zechestein). This indeed, is not unlikely, for the following reasons. First, it is the opinion of eminent living geologists (Professor Sedgwick, Mr. Murchison, and others) that in strata which correspond in age to the old red sandstone, there occur groups of organic remains intermediate in fossil characteristics between the types of the Silurian and carboniferous series. Secondly, it is ascertained that a large proportion of the forms of zoophyta, mollusca, and fishes, which appear in magnesium limestone, are extremely analogous to or even identical with some of the more numerous forms of the Palaeozoic series of rocks. It is thus seen that the Palaeozoic series of rocks includes the following formations, placed in the order of position, according to the most recent views:

Old Red-Sandstone. This in whole or in part is supposed by Mr. Murchison and others to be represented by the coal seams, arenaceous, and argillaceous rocks of North and South Devon, Cornwall, part of Brittany, the Harz, Westphalia; and they prefer to call the series Devonian, from the country where it is supposed to be best developed.

Mr. Murchison ranks these in four formations, viz. Ludlow Rocks, Wenlock Rocks, Coradoc Rocks, Llandoilio Rocks.

Cambrian Rocks. Professor Sedgwick subdivides them into Plynlimmon Rocks, Bala Limestone, and Snowdon Rocks.

It is supposed, but perhaps has not been perfectly ascertained, that the rocks of Skiddaw, &c., which come next in order below, are deficient of organic remains. May we propose for these and other lower stratified rocks the term 'Ordovician.'

PALEPHATUS. Four Greek writers of this name are mentioned by Suidas, the oldest of whom, an epic poet, a native of Athens, is said to have lived before the Homeric time. He is the author of the title of his work, "Cosmopoeis," "The birth of Apollo and Diana," &c. The second was a native of Paros or Priene, who lived in the time of Artaxerxes Meneemon, and to him Suidas ascribes a work in five books entitled "On Things Incredible." The third Palephatus was an historian of Abydos, and a great friend of Aristotle. The fourth is called a grammarian of Alexandria by Suidas, and a Peripatetic philosopher by Tzetzes and others; the period in which he lived is not stated. Suidas mentions a work by him entitled "Explanations in Mythology." This seems to have been the work which has come down to us in one book divided into fifty short chapters, under the name of Palephatus, and which is commonly entitled "On Things Incredible." The author explains, according to his fashion, the origin of the many marvels of the mountain. These explanations were called "explanations," &c., to which he attributes an historical discretion or corrupted by ignorance or love of the marvelous. The best edition of the text of that is that of Fischer, Leipzig, 1789, in which he has given all the passages of art, and has supplemented the name of Palephatus. A Latin translation of the work was published at Cambridge, in 1671, and a French translation was published at Lausanne in 1771. There are some other fragments under the name of Palephatus which have been published with the work above mentioned, one on the invention of the purple colour, and the other on the first discovery of iron. (Vossius, De Historiae Graecae; Fabritius, Bibliotheca Graeca.)

PALESTRA (pa-le-ste'ra), which properly means a school for wrestling (wrestling, to wrestle, and edsa, wrestling), was used in several different significations. The word first occurs in Herodotus (v. 126, 128), who informs us that Clithenes built at Sicyon a dromos or palestra, both of which he calls by the general name of gymnasia. At Athens however it appears probable that the palestrae and gymnasia were distinct places, and that the former were appropriated to the gymnastic exercises of the boys and youths (wrestling and jumping), while the latter were intended for those of the mountain. These palestra were called by the names either of their founders or of the teachers of the gymnastic exercises (mecrophiadai). We accordingly read in Plato of the palestra of Taurus, which appears to have been one of the most celebrated. (Plato, Charmid., c. 1; with Heindorff's Note.)

In most of the other cities of Greece the Palestra formed part of the Gymnasium. According to Mulius (Archiedade der Kunst, p. 344) it included the stadioi, idios, stadioi, kokinos, octos, bys, amphiros, amphiros, kokinos, eker, eker, bys, in fact even part of the gymnasia except the outer porticoes. It appears however more probable that the term palestra was confined to the rooms which were appropriated to the exercises of the athletes, who, it must be recollected, were persons who especially trained for contending in the public games, and therefore needed a course of gymnastic exercises different from that which was usually pursued. That this view of the subject is correct, is shown by the statement of Pausanias, who informs us (vi. 21, l. 21) that in the gymnasia of Greece there were halls for the athletes, and also by that of Plutarch, who says (Symp., ii. Prob. 4) that the place in which all the athletic exercise is called a palestra.

Among the Romans the terms Palestra and Gymnasia are used as synonymous. Thus Vitruvius gives a description (v. 11) of a Greek gymnasion under the name of palestra. In the Greek cities in Sicily and Italy there also appears to have been no distinction in use between the two words (Cic. in Ferr., ii. 14; Polyb., xiv., p. 716, c. Cassibon; whence the Romans probably came to use them as synonymous. [GYMNASIUM.

PALAMEDEA (Linn.), a genus of birds placed by Mr. Vigors among the Grallatores, with its congeners Parra, Chauna, Rallius, and Palus, in the family Rallidae. The same author thinks that Parra may be allied Palamedea, Linn., and Chauna, Ill. (the Parra chariaria of the 'Systema Naturae'), both of which seem to approach Parra in affinity, although the latter of them is so imperfectly known, that its situation cannot be decided with certainty. [Rallidae, c. xiv.]

Mr. Swainson (Classification of Birds) gives Palamedea a position between Megapodidae and Dicholophus in his family Megapodinae (Megapodidae ?), which comes immediately after the subfamily Columbinae of his family Columbidae, and forms his order Rallaceae.

Cuvier places the form among his Macroactylos, Echasi, or Waders (Graller, Linn.), between the Jacanas and Briston (Parra, Linn.) (Rallidae) and the Megapodiidae (Megapodiidae), or the family of Dinomachi (Palamedea, Linn.), which contains Palamedes and Chauna of Illiger.

M. Lesson arranges the genus Kamichi (Palamedea, Linn., Anhima, Briss.) under his family Rallaceae. Palamedea is immediately preceded by the Jacanas (Parra, Linn.), and succeeded by the genus Chauara (Chauna, Ill.), which last is followed by Glareola. The Palameditae then may be considered as a natural family consisting of the genera Palamedea and Chauna.

Palamedea.

Generic Character. Bill shorter than the head, covered at the base with small feathers, conico-convex, slightly vaulted, hooked at the point. Forehead armed with a cylindrical horn, which is pointed. * Notriost oval, open. Wings spurred, third and fourth quills longest. Antex toes united at the base by a membrane; hallux touching the ground at the end.

Head of Palamedea. (Swainson. From the specimen in the British Museum.)

Example, Palamedea cornuta: the Kamichi, or Horned Scraper.

Description. — Larger than a common goose; greenish-

* Mr. Swainson states that he believes that this long speck-shaped horn is movable at its root. There is a large broad-scaled spur on the third, and another on the lower edge of that portion. These are truly loss in the male; and there is also on the outer side of the small middle toe, pal. nose.
born above, except on the middle of the neck, which is
vase-colored with black and white, and a large cinnamon-
coloured spot on the shoulders; abdomen white; a long-
spear-shaped horn projects from the forehead; wings long
and pointed; tail wide and square; tarsi slender and re-
tectuated, as well as the toes, which are long and almost
entirely free; claw of the hallux nearly straight and very
sharp; two spurs implanted on the edge of the wing.

This, the only known species, is the Anthima of the Bra-
zilians, and, according to Cuvier, the Camouche of the people
of Cayenne; but M. Lesson thinks that it is the Kotacca of
Barrett.

Habits.—This extraordinary bird lives in the marshy or
inundated places in South America (Guiana and Brazil),
which it makes resound with its wild and loud cry. Its food
consists of grains and aquatic herbs, as its muscular stomach
would indicate, though there are not wanting those who
state that it hunts reptiles. It pairs, and lives faithfully
with its mate.

**Palamedes ornatus.**

**Chawa.**

**Generic Character.**—Bill shorter than the head, clothed
with small plumes at the base, conico-convex, slightly
vaulted, curved at the point; head unarmored; lore naked.

**Wings** spurred. External **toes** united at the base by a
membrane; hallux touching the ground at the end; poste-
rior and intermediate claws nearly straight. Tail graded.

**Example.** Chauna Chavaria.

**Description.**—No horn; occiput ornamented with a circle
of feathers capable of elevation; head and upper part of
the neck down; a black collar; the rest of the plumage
lead colour and blackish, with a white spot on the bend of
the wing and another on the base of some of the greater
quills; hardly any part of the leg naked. Length of adult,
32 inches.

This is the Chaqua or Chaaja (a name, as we shall pre-
sumably see, derived from the cry of the bird) of the people
of Paraguay.

Habits.—D’Azara has given us many interesting particu-
lar facts relating to this bird. Its sharp clarion-like cry is ex-
pected not only during the day, but also in the night, if it
hears any noise. The note of the male is expressed by the
word Chaaja, and that of the female (for they answer each
other) by the word Chaqua. They are seen sometimes
 singly, sometimes in pairs, and at other times in numerous
bodies. They principally, indeed, ordinary, frequent
marshes, and if they are at any time found on the banks of
rivers, it is in places where the water is low and runs sluggish.
They do not swim, but enter the water like Horses, but
like them, in search of fish or frogs, but for the leaves
and seeds of aquatic plants on which they live.

D’Azara saw some brought up among the domestic poul-
try at country-houses, and they were as tame as fowls.

Those who kept them told him that the Chaaja ate bits of
raw meat, but he saw them picking the grass. They perch
on the tops of the highest trees. On the ground they walk
with gravity. Some state that the nests are spacious,
and formed of small branches on bushes surrounded with water,
and others that the bird places it in the rushes in the midst of
the water. The eggs are laid in the beginning of August,
and the young, which are two in number, follow their par-
ents, though they are only clothed with down.

The Indians of Carthagena rear them among their geese
and other poultry, under the idea that they will act as a
guard, for the Chaaja is very courageous and will drive away
a vulture. D’Azara says that both this bird and the Ka-
michi are provided with a cottony down at the base of the
feathers like swansdown; that the plumage of the neck is a
little loose and inclining to downy; and that the skin of the
neck is separated from the flesh by an interval of a line and
a half, which is filled with cellular integuments, into which
the air is introduced. The down at the base of the plumage
is evidently calculated to keep up the proper temperature of
the bird in its marshy home, and to repel the water when it
wades so deep as to immerse the plumage.

**Locality.** Paraguay, on both banks of the Rio de la Plata,
and in Brazil, far from human habitations.

**Palamedes ornatus.**

**Chawa.**

**Generic Character.**—Bill shorter than the head, clothed
with small plumes at the base, conico-convex, slightly
vaulted, curved at the point; head unarmored; lore naked.

**Wings** spurred. External **toes** united at the base by a
membrane; hallux touching the ground at the end; poste-
rior and intermediate claws nearly straight. Tail graded.

**Example.** Chauna Chavaria.

**Description.**—No horn; occiput ornamented with a circle
of feathers capable of elevation; head and upper part of
the neck down; a black collar; the rest of the plumage
lead colour and blackish, with a white spot on the bend of
the wing and another on the base of some of the greater
quills; hardly any part of the leg naked. Length of adult,
32 inches.

This is the Chaqua or Chaaja (a name, as we shall pre-
sumably see, derived from the cry of the bird) of the people
of Paraguay.

Habits.—D’Azara has given us many interesting particu-
lar facts relating to this bird. Its sharp clarion-like cry is ex-
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**Locality.** Paraguay, on both banks of the Rio de la Plata,
and in Brazil, far from human habitations.
pended to its middle, hangs loosely backwards into the cavity of the pharynx. Both the hard and the soft palate are covered by a thin layer of vascular mucous membrane, immediately beneath which there are numerous minute glands. On each side, the soft palate is continued downwards into two diverging and arch-shaped folds (the arches of the palate), which form the lateral boundaries of the fauces, and between which on each side the tonsil lies. Beneath these folds are muscles passing from the soft palate to the side of the upper pharynx.

The hard palate serves as a firm support against which the food may be pressed by the back of the tongue during mastication; and it is by the various actions of the tongue upon it that we articulate several letters, as d, g, j. A person with a large palate is capable of much movement of the contractions of its muscles, that it can either be raised so as to close the passage from the pharynx to the nose and Eustachian tube, or be depressed so as (with the assistance of the tongue) to close the passage from the pharynx to the mouth. By a simultaneous descent of the soft palate and contraction of the lateral arches by which it is connected with the tongue, the food when forced to the back part of the latter organ is impelled into the pharynx, constituting the first part of the swallowing. So important is the function of this organ, that the action is not lost, or a great degree of it impaired, in the actions by which substances are expelled from the digestive and respiratory organs through the mouth or nose, directing their passage, according to circumstances, into one or other of those cavities, as in coughing.

The chief affection to which the palate is liable is that called cleft palate, a congenital malformation of the same nature as hare-lip [HARE-LIP], in which a fissure extends along more or less of the palate, and forms an unnatural connecting channel between the mouth and the nose. The fissure may extend from the back of the teeth through the whole of both the hard and soft palates, or it may consist only in a small aperture in one or other of them. It may also extend from the mouth to the nose on the one side, or more or less to either side. According to its size, it produces inconvenience by allowing the passage of substances from the mouth to the nose, or in the opposite direction, and by impairing the speech by permitting the air impelled towards the front of the mouth to pass through the posterior part of the nose: hence the peculiar nasal and blowing sound by which the speech of persons thus affected is distinguished. Various operations have been proposed for the cure of this deformity. Those on the soft palate are conducted on the same principles as the operations for hare-lip, and are employed so as to close the peculiar cleft which arise from the position of the part. Those on the hard palate consist of either cauterising the edges of the fissure, or endeavouring to make a portion turned up from the adjacent membrane, to adhere to its edges. No operation has been performed to attempt the perfect cure of the cleft palate, and there is no hope of success when the fissure is extensive; and the results of those on the soft palate are generally very uncertain. The patient must usually be contented with the palliation that is afforded by a false palate, which consists of a plate of gold or silver secured to both the upper and lower jaws, so as to cover the aperture in it, and fixed there either by springs and wires attached to the teeth, or by sponge passed through the aperture into the nostril.

PALATINE, THE. There were formerly two states in Germany of this name, which, till 1620, were under one sovereign: they were not contiguous, and were called, by way of distinction, the Upper Palatinate and the Lower Palatinate, which was called likewise the County Palatine of the Rhine. The Palatinate was divided by Bayreuth, Bohemia, Neuburg, Bavaria, and the territory of Nürnberg. In 1807 its area was 2730 square miles, and the population 283,733. The capital and seat of government was Amberg. It now belongs to Bavaria, and is a very hill country: its chief wealth consists in the forests and pastures, and in its mines and quarries: it does not produce sufficient corn for the consumption of the inhabitants.

The Lower Palatinate was situated on both sides of the Rhine, and was bounded by Strassfurt, Lützenburg, Baden, Alsace, Lorraine, and Treves. The chief cities were Mannheim and Heidelberg. It comprehended the principalties of Simmern, Zweibrücken (Deuponts), Veldenz, and Lautern, and the County Palatine properly so called. It belonged to the elector palatine; and notwithstanding the ravages which it has suffered at different times, it is one of the most fertile and flourishing counties in Germany. Its area is about 1609 square miles, and the population is now above 300,000.

It is hard to trace the history of a country which, after having undergone numerous changes, is now divided among different German sovereigns, and the very name of which has disappeared from the maps of Germany. A few lines will suffice. The Counts Palatine of the Rhine had obtained, in the antediluvian century, the hereditary sovereignty of the County Palatine and of its dependent principalties. The Upper and Lower Palatinate remained united under one sovereign till 1620, when the elector Frederick V., who had married the Princess Eliza-

The Bavarian male line becoming extinct on the death of the elector Maximilian III. in 1777, the elector palatine Karl Theodor, being without any male heir, by the exception of a small portion which came to Austria, and preferred his residence to Munich. Conformably to the stipulations of the treaty of Westphalia, he recovered the fifth place in the electoral college and the dignity of hereditary treasurer to the elector of Brunswick. Charles Theodore dying without issue in 1799, he was succeeded by Maximilian Joseph, duke of Deuponts. [BAYER.]

In the wars of the French Revolution, the French took possession of the Palatinate, and declared it a free and independent country. It was restored to the house of Bavaria by the Congress of Vienna, and the left bank of the Rhine, and retained it by the treaty of Luneville, 1801. Thus Deuponts, Simmern, Veldenz, Spanheim, &c., and about 930 square miles of the Palatinate proper, were lost. The territory on the right bank of the Rhine, which besides about 300 square miles of plain, had a revenue of 600,000 florins, was ceded by Bavaria in 1802, for other provinces. Baden obtained about 380 square miles, with 9736 inhabitants, and the电视机, and the rest with 26,500 inhabitants. By the treaty of 1819, Bavaria recovered the greater part of the territory on the left bank of the Rhine which it had lost in 1801. The remainder was allotted to Hesse-Darmstadt.

PALATINE COUNTIES. Two of the English counties, Chester and Lancaster, are counties palatine, and the earls of Chester and the dukes of Lancaster bear the titles of counts palatine. The county of Pembroke, in Wales, was at one time a county palatine, in the same sense as the Palatinate in Germany; a county palatine in the general sense is a county: its chief wealth consists in the forests and pastures, and in its mines and quarries: it does not produce sufficient corn for the consumption of the inhabitants.

Counts palatine were of feudal origin; and a reference to their history will clearly explain the meaning of the title, and the many of the incidents of these territorial dignities in England. Selden says "the name was received here doubtless out of the use of the empire of France, and in the like notions as it had in that use" (Titles of Honour, part 2). In the court of the ancient kings of France, before the time of Charles Magne, was a high judicial officer, called the
Comes Palatii, a kind of master of the household, whose functions nearly resembled those of the Praefectus Pretorio in the Praetorian Guard, and was vested with authority in all causes that came to the king’s immediate audience. (Selden’s _Titles of Honour_, part ii., chap. 33.)

When the seat of empire was transferred to France, this title and office still continued, but the nominal dignity, as well as a degree of jurisdiction and power analogous to those of the ancient functionary, were also given to a different class of persons. When the sovereign chose to confer a peculiar mark of distinction upon the holder of a certain fief or province, he expressly granted to him the right to bear the same name, power and jurisdiction within his fief or province as the comes palatii exercised in the palace. Hence he also obtained the name of comes palatii or palatinius, and by virtue of this grant he enjoyed within his territory a supreme and peculiar jurisdiction, having royalties, or jura imperii, by which he was distinguished from the ordinary comes, who had only an inferior and dependent authority within his district or county. This was the origin of the distinction between the Pfalzgraf and the Graf in Germany, and between the count palatine and the ordinary count or earl in England. Hereafter, he had not observed the word ‘palatine’ thus used in England until about the reign of Henry II.

In conformity with this view of their origin, the counts palatine in England had jura regalia within their counties, subject to the crown, but independent of the royal court. They were actually the royal lieutenants, and the powers which they exercised over the county were judicial and executive, and not ministerial. They were, in fact, not really connected with the royal civil administration, but were more in the nature of royal military commanders. The counties, therefore, were not the royal estates, but the counties of the crown.

The title of count palatine, being naturally a crown position, was of great importance to the counts palatine. They were chosen by the king, and their titles were conferred by him. They were not appointed by the government, but were selected by the king. The title of count palatine was a mark of distinction and honor, and was a sign of the king’s favor and regard.

The appointment of a count palatine was an important event in the history of a county. It marked the beginning of a new era in the county’s political and social life. It was a sign of the king’s recognition of the county’s importance and potential for the kingdom. It was a sign of the king’s trust in the county’s leaders and their ability to govern the county well.

The title of count palatine was not only a mark of honor and distinction, but it also brought with it certain rights and privileges. The count palatine was entitled to certain immunities and exemptions, and was not subject to certain taxes and duties. He was also entitled to certain privileges in the law courts, and was able to exercise certain powers in the county.

The appointment of a count palatine was a matter of great importance to the county, and was a matter of great prestige. It was a sign of the county’s importance and potential for the kingdom. It was a sign of the king’s trust in the county’s leaders and their ability to govern the county well.

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bounded on the east by the province of Messina, on the west by that of Trapani, and on the south by the provinces of Girgenti and Calatanissetta. Its area is reckoned at 3700 square miles. (Neegebaur.) The province of Palermo is divided into the four districts of Palermo, Corleone, Termini, and Cefalù, and according to the last census contained 475,570 inhabitants. It is the most populous of the seven administrative divisions of the island, and the population is yearly increasing. The surface consists partly of naked hills and partly of fertile valleys, among which that called the Conca, or "shell," of Palermo, is one of the finest regions in the world. The general slope of the ground is to the north, as the prevalent wind is from the west, and the anticlinal ridges, which cross the island from east to west, to the sea-coast. Numerous short watercourses run in that direction; they are dry, or nearly so, in summer, but become impassable torrents in the rainy season. The principal are the Trisleri, or stream of the Fiumicello, and a number of lesser rivers between Termini and Cefalù. The principal productions of the country are corn, oil, oranges and lemons, manna, su- mac, liqueur, almonds, pistachio nuts, and silk. Of late years manufactures have been established at Palermo, and in its neighborhood, of cotton and silk stuffs, straw hats, soap, paper, and cream of tartar. The principal towns are:

1. Palermo. 2. Termini, a town of 15,000 inhabitants, with a harbour, a castle, and an old cathedral, in a fine situation: Mount Calogero, one of the principal, summits the rocks. The numerous springs and basins of water in the suburbs are employed in the tunny, anchovy, and sardine fishery, and in maritime trade. The ruins of the ancient Himera are about 12 miles distant. The hot mineral waters of Termini are much frequented, and supplied by the adjoining baths. 3. Cefalù, a town of 8000 inhabitants, built on the sea-coast at the foot of a high cliff, with a handsome collegiate church. 4. Corleone, an inland town, with 13,000 inhabitants, chiefly employed in agriculture. 5. Monreale, 5 miles west of Palermo, with 15,000 inhabitants, a splendid Benedictine abbey, founded in 1174, the church of which has become the cathedral of the archbishopric. It is rich in marble and paintings, and contains the tombs of the Norman kings William I and II. 6. Cerini, the ancient Hecateopolis of Greece; a famous courtzean Laiz, has 6000 inhabitants. 7. Piana dei Greci, 15 miles south of Palermo, an Epirope colony, with about 5000 inhabitants and a Greek church.

The small island of Ustica, situated about 30 miles from the coast of Palermo, is inhabited by about 1200 inhabitants. It has a small fort, and produces good wine.

PALERMO (the ancient Panormus), the capital of the island of Sicily and the second city of the united kingdom of the Two Sicilies, is situated on the north-west of Sicily, about 20 miles from Messina. It is built on the west and Cape Zafferano to the east. Palermo is situated in 38° 7' N. lat. and 13° 22' E. long., in a fine and fertile plain between two mountain ranges and the sea. The town is an oblong parallelogram, surrounded by walls formerly very strong, but in the 12th century, was formed with many fortifications in the middle of which was a castle. (Palermo in Circumvallatione, the suburbs not included. A fine street, called Il Cassaro, a corruption of the Arabic word Al-kas, the palace, runs through its length from the sea to the royal palace, which is at the opposite inland extremity of the town, and is crossed at right angles towards its middle by another handsome street, called Strada Macqueda. The square before the royal palace is adorned with a bronze statue of Philip IV. of Spain. Another smaller square, in the midst of which is a fountain, called by the natives "la cisterna," decorated with a curious fountain enriched with statues and figures of various animals, which spout the water into several basins. The houses of Palermo are built nearly in the same style as those of Naples, with flat roofs, and windows adorned with balconies. The most remarkable buildings are the following:—1. The royal palace is an old building fortified like a castle, with a fine hall, a spacious court, and a splendid chapel, built by King Roger in 1129, and enriched with mosaics and with a fountain of alabaster, porphyry, and other valuable stones. On the summit of the palace is the Observatory, which was for many years under the direction of Father Valzer, who discovered from it the planet Ceres in 1801. 2. The cathedral, a magnificent Gothic structure, built about the end of the twelfth century, is adorned with numerous statues; it contains the mausoleum of King Roger, the Norman founder of the monarchy, of the emperor Henry VI., of his wife Constance, and their son Frederick I., the remains of each being deposited in a handsome porphyry urn. The great altar is very rich and adorned with lapis lazuli and gold. 3. The church of del Gesù is remarkable for its architecture and for the richness of its marble decorations, its paintings, and sculptures. Palermo has many other churches, most of which are deserving of notice, such as the Maria del Popolo, of the Gothic or Saracenic style, those of the Teatini, of Ollivella, of Santa Zita, I. Ignazio, S. Filippo Neri, all rich with marble, paintings, mosaics, &c. The church of the Capuchins is remarkable for its vaults, in which the bodies of many distinguished men are honorably interred, and others are seen dressed in white, standing in niches in various attitudes, and with their garments on, some being two or three hundred years old. The same display is exhibited in the Capuchin convent at Malta. 4. The university, founded in 1442, is attended by about 3000 students. 5. Besides the great hospital, Palermo has three others, besides a foundlings' asylum, a hospital of the insane, which is much extolled for its enlightened and humane methods of discipline, an Albergo dei Poveri, for the poor, and other beneficent institutions. 6. The palaces of the rich nobles, in the city, are very splendid, with their gardens, Ventimiglia, and Travia are the most remarkable. 7. The promenade along the sea-side, called La Marina, which leads to the fine public gardens called La Flora, with a botanical garden. Palermo has two theatres, five opera houses, and three bands, three theatres, and four bands for soldiers, and a castle, called Castello a Mare, which commands the roads. The harbour of Palermo is at some distance outside of the town, and is formed by an artificial mole, which however does not protect it effectually from becoming a port. Palermo is at all seasons a favorite resort at all seasons. At the sea-coast are, innumerable ruins, a museum of antiquities, with some fine statues and a fine collection of Greco-Sicilian medals. The academy of the fine arts, opened to the university, has a gallery of valuable paintings chiefly bequeathed by the late prince of Belmonte. Besides the great hospital, Palermo has three others, besides a foundlings' asylum, a hospital of the insane, which is much extolled for its enlightened and humane methods of discipline, an Albergo dei Poveri, for the poor, and other beneficent institutions. 6. 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which forms a part of the 'Pictorial History of Palestine,' by the editor of the 'Pictorial Bible,' a work in which nearly all the information we possess upon the subject is collected.

Mountains.—Palestine is a very mountainous country. A
mountain-range commences in Syria south of the Orontes, and
stretches to the south as far as the sources of the Jordan,
where it divides into two branches, which continue their
Course northward to the head of the Gulf of Aksa; the one
running along the eastern coast of that gulf and terminating on
the shores of the Red Sea; the other along the western coast
of that gulf and terminating in the mountains of Sinai.

The mountains of Lebanon, which are a part of this
mountain system, form the northern boundary of Palestine.
They consist of two ranges, enclosing a fertile valley of
the average width of fifteen miles, which is bounded on
the north by Canaan-Syria (Hollow Syria), and is now called El Bekka (the valley). The western range inclines towards the sea,
and terminates at the mouth of the Leontes, near Tyr; the
eastern extends southward into Palestine, and divides into
two branches, as above described. The name of Lebanon
is applied in Scripture indifferently to either or both of
these ranges: by the Syrian Greeks the western was
called Libanus (now Jebel-el-Sharki, the western mount-
in), and the eastern Libanos (now Jebel-el-Sharki, the eastern mountain). Lebanon is by far the highest part of the Syrian mountains. The
summit of the western range is quite barren; but the
lower slopes, especially on the western side, are inhabited
and cultivated. About the middle of summer the
summits are the remains of the celebrated cedars of Lebanon. The
Anti-Libanus is in general not so high as the western ridge;
but at the point where it divides into the two branches which
enclose the basin of the Jordan, it rises above all the other
mountains of Lebanon, and is called Jebel-Sha’ar. Jebel-Sha’ar,
which means a 'Mountain of Sharon,' whose summit is covered with perpetual
snow. The height of these mountains has never been
measured. The eastern range is more barren, and has
fewer inhabitants than the western. As this range passes into
Palestine, it diminishes in height and extent, and becomes
more fit for tillage; but at the Dead Sea it consists of
deolate rocks. Almost all the mountains of Palestine may
be regarded as belonging to the two principal ranges which
include the basin of the Jordan. The most remarkable
are the following—Mount Tabor, the highest mountain
in Lower Galilee, stands on the north-east of the plain of
Esdraelon. It is entirely detached from the surrounding
mountains, and is nearly of an hemispherical figure. On
its summit is a plain of about half an hour in circuit, which
is enclosed by a wall. To the east of this mountain old tradition has to have been the scene of our Saviour's trans-
figuration. A range of fertile hills about five miles south-
west of Tabor is generally considered to be the Mount
Hermon mentioned in the Psalms (Ps. xlvii. 6 of which
it is called the Little Hermon, to distinguish it as the
highest peak of the same name in Anti-Libanus. To the south
and south-east of Tabor are the mountains of Gilboa of Scrip-
ture (Jebel Gilbo), a sterile range of hills, about 1000 feet
above the level of the sea; they bound the valley of the
Jordan on the west for some miles. The range of Carmel,
the termination of which forms the only very prominent
headland on the sea-coast of Palestine, lies almost due west
of Mount Tabor. The promontory in which it terminates
runs inland to the south-east till it joins the principal range.
It is only of moderate height, and is covered with forests
and grass. To the south of the plain of Esdraelon lie the
mountains of Samaria, which are beautifully wooded, chiefly
with oaks and cedars, and form a grand scene. Some of the
mountains perhaps the highest are those of Ebal and Gerizim, which are separated from each other by a valley
200 or 300 paces broad. From these mountains were del-
ivered the curses and the blessings of the Law. The Sama-
rians had their temple on Mount Gerizim. Mount Gerizim
is esteemed the holiest of mountains. Judæa, or the southern
part of Palestine, is full of hills, which are divided by valleys
and torrents, and are for the most part of moderate height.
They are composed down by the torrents, particles of which
are deposited on the slopes of the mountains. In ancient times
these terraces were planted with the olive, the fig-tree, and the vine. At pre-

In describing the physical geography of Palestine, we
follow for the most part the 'Physical History of Palestine,'
sent the rocks are for the most part barren and desolate. In the eastern part of Judaea, on the borders of the Jordan and the Dead Sea, is a wilderness of mountains, the most rugged and desolate in all Palestine. This mountainous district, which is the highest in Judaea, bears the name of Quaran-tania, from a tradition that this was the wilderness in which Christ fasted forty days and nights: the highest summit among these mountains is called the Mountain of Tempta-tion, which is pointed out by tradition as The devil showed our Saviour the kingdoms of the world. The most mountainous part of Judaea is the district round Jerusa-
lem. [JERUSALEM.]

Of the mountains on the east of the Jordan little is known. Beginning at the Jebel es-Shekh, almost unnoticed, we find the mountains continuing southwards for about twenty-five miles under the name of Jebel Heish, and terminating at a point about ten miles to the east of the lake of Gennesareth. To the south of this mountain, for about ten miles, there is a flat plain, divided by the river Jarmouk, and containing the pasturage-lands of Argob and Bashan. To the south of this district lies the land of Gilead, the mountains of which are the most considerable on this side the Jordan: they are for the most part wooded, chiefly with the wind-pine and acacia. To the south of the river Jabbock (Zerka) the mountains are less elevated though broader. About six miles to the south of the river Jabbock is a ridge running east and west for about seven miles, the name of which (Jalalah) bears a trace of the antient Arabic word ( jabal), meaning mountain. As it is near the latitude of the Dead Sea, it diminishes in breadth; and somewhat below the head of that sea it widens out again, and forms the mountains of Seir. [IDOMENA.] Among the mountains at the head of the Dead Sea, which Nebo (probably Atarneus), from the summit of which Moses was permitted to see the promised land.

Geology and Mineralogy. — Limestone is the prevailing constituent of all the mountains of Syria, as well as of Asia Minor, and the general character of the limestone stones which compose the great central ridges of Syria, or which ramify from them, is that of a hard calcareous rock, sonorous when struck, and of a whitish or pale yellow colour. It is in short a very hard kind of limestone, distinguished in its structure and texture, and like all limestone strata, affording a great number of caverns, to which frequent allusion is made in the Scriptures. Some of them are capable of containing 1500 men, and there is one near Damascus which will even afford shelter to 4000. (Pict. Hist. Israel.) North of the Dead Sea, in the extreme north of Palestine the calcareous rock is said by Burckhard to be 'of considerable hardness, and of a reddish yellow colour.

The limestone rocks of which Lebanon is composed are of a bright colour, from which circumstance the name of the mountain is supposed to be derived. The strata (at least at one point noticed by Burckhard) are horizontal, varying from a few yards up to thirty or forty yards in thickness. The rock which lines the valley of the Jordan an inch thick, is chalky white: in the limestone strata, and the mountains of Lebanon or of central Palestine; and it diminishes in compactness as we approach the Dead Sea. In the neighbourhood of Om Keis, to the south-east of the lake of Gennesareth, there is a considerable quantity of black basaltic rock and basalt, a black volcanic matter, which prevails on the east of the Jordan between the river Mandhur and Zerka. This black basaltic rock is also found in large quantities in the plain of the Haouar, farther to the east. In mountains south of Zerka the calcareous stone is interposed with layers of sandstone of different colours, and large blocks of black basalt. The hills about Jerusalem are of a hard light-coloured limestone, which, as we approach the Dead Sea, is exchanged for white chalk. In the limestone of a layer of reddish micaceous stone (scabrum parum micaceum). On the shores of the Dead Sea perpendicular strata of a reddish brittle earth are seen in several places. The black basaltic rock of the Haouar extends along the whole eastern border of the country. In the parts near the Jordan it is generally found in detached masses. Traces of basalt are also found on the west of the lake of Gennesareth. Slate is found about the Dead Sea.

In many places the hard calcareous stone is covered by rock and chalky strata containing corals, shells, and other marine exuviæ. In the chalky beds about the summit of Carmel are found hollow stones lined with sparrock material, which resemble petrified oaks and other fruit. These 'lapides Judææ' (as they are called) are sold to pil-grims as an antidote against various diseases.

This chalky formation appears very conspicuously in the White Cape (Ras el Abaid) below Tyre, the Alabam-ronitorium of the Romans. There are indications of coal in various parts of Lebanon and of Kessara mountains, and in other parts of Palestine, there are numerous fossil plants, fishs, shells, and even vertebrates, which they were found in antient times appears from the frequent mention of them in the Jewish history. In modern times the mineral wealth of the country has been almost entirely neglected. Iron abounds in Lebanon and Kessara mountains, and exists as native iron or oxide. As it is near the latitude of the Dead Sea, it diminishes in breadth; and somewhat below the head of that sea it widens out again, and forms the mountains of Seir. [IDOMENA.] Among the mountains at the head of the Dead Sea, which Nebo (probably Atarneus), from the summit of which Moses was permitted to see the promised land.

The indications of volcanic action are chiefly confined to the basin of the Jordan and its lakes; and they are most frequent about the lake of Tiberias and the Dead Sea. The country is very fertile, and yet numerous evidences of these meteoric phenomena round the Dead Sea. There are hot-springs at Tiberias, on the western side of the lake of Tiberias, and at other places round the lake, which has itself a striking resemblance to the crater of a volcano. In the neighbourhood of the Dead Sea this country is very fertile, and yet numerous evidences of the volcanic action. On which the valley of Siddim was full in antient times (Gen., xiv, 10), and other traces of the 'brimstone, salt, and burning,' by which the cities of the plain were overthrown.

Palestine has been the scene of repeated earthquakes. A very destructive one occurred in the year 640. In the extreme north of Palestine the calcareous rock is said by Burckhard to be 'of considerable hardness, and of a reddish yellow colour.

Valleys, Plains, and Deserts.—From the general disposition of the high lands in Palestine, it follows that the chief valleys are longitudinal, and run from north to south. The transverse valleys have a general east and west direction, bounded on each side by the offshoots of the ranges. The chief plain country is the low land along the Mediterranean on the west of the central range of mountains. The chief valleys are to the east of that range, and are the Bekka between Lebanon and Anti-Lebanon, the valley of the Orontes extending from the Dead Sea to the Atlantic Gulf. The flat country along the coast varies considerably in breadth, and is diversified by elevations which are offshoots from the central mountains. The soil of this part of the country is very fertile, and the climate is healthy. The climate along the coast is very warm. To the south of Canaan is the celebrated vale of Sharon, which is terminated in the neighbourhood of El Arish by a sandy desert, and also extends to the eastward of Shur and Paran) which extends westward to Egypt, and eastward to the peninsula of Arabia, extending from the Dead Sea to the Atlantic Gulf.

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north to south, and in its lowest part, the surface of the Dead Sea, is about 600 feet below the level of the Mediterranean. (London Geog. Journal, vol. vii., p. 256.) A recent traveller (Russegger) makes it 1400 feet below the level of the Mediterranean; but such a remarkable fact, which is opposed by other evidence, must be received with doubt. The valley is very warm, and as it also possesses abundance of water, it is singularly fertile. The name of the valley of the Jordan is usually restricted to the part between the lake of Tiberias and the Dead Sea (now called El Ghora), which is about 65 miles long, and 3 or 4 miles wide beyond the Dead Sea, but which is greatly much narrower towards the Dead Sea, near which it is made up into the plain of Jericho on the west and the plains of Moab on the east of the Jordan. The plain of Jericho is about 18 miles long by 7 or 8 broad, and is bounded on the west by an amphibious ridge of hills which is near the village of Jericho, and on the east by the tells of Sebaste and Balseh, and flows in a south-westerly course to the Mediterranean, into which it falls a little to the north of Tyre. The most important river of Palestine is the Jordan (Sheriat-al-Kebir), which rises nearly in the north, in the midst of the great mountain-ranges of the Lebanon, and after traversing the lakes of Samocchonitis and Gennesareth, falls into the Dead Sea. Its source, or at least what is generally considered to be its source, is a cave on the north-east side of Wadi el-Hume, near the village of Sur, in the neighbourhood of Balseh. From this source, however, there are three other springs which have been taken to be the true source of the Jordan, and perhaps this distinction might properly be assigned to a stream which rises in the hill of Tel-el-Kadi, about 3 miles north-east of Panias, on the slope of Mount Hermon. The name *Wadi el-Hume* is a corruption of *Wad el-Hole*, the waters of Muram of the Old Testament, and the lake Samocchonitis of Josephus. The size of this lake varies with the season of the year. Josephus makes it 7 miles long by half that breadth, which appears to be about the average used by the ancients. It abounds in fish. The waters are muddy, and are said to be wholesome.

After a journey of 10 miles from the point where it quits this lake, the Jordan enters the Bahr-el-Tubarah, the sea of Tiberias, or lake of Gennesareth, or sea of Galilee of the New Testament. The dimensions of this lake are stated by Buckingham to be from 12 to 15 miles long, and from 3 to 9 miles wide. It is surrounded by mountains, and all travellers describe its scenery as exceedingly beautiful. The water is cool and clear, and contains a great quantity of excellent fish. Its margin is the resort of innumerable birds. The course of the Jordan is distinctly traced in a smooth stretch of water about 5 miles in length.

The Jordan flows from the southern angle of this lake through a narrow valley, which may be considered as the bed of the river, and the level of which is lower than that of the large valley around it, which we have before spoken of as the valley of Dead Sea. This valley is about three-quarters of a mile in breadth, and is covered with trees and luxuriant herbage. In the winter it is inundated by the river. In the summer the Jordan is fordable in many places. Its course when it leaves the lake is very rapid, but it diminishes in speed as it proceeds. At its junction with the Dead Sea it is 200 or 300 feet broad. The whole course of this river is about 100 miles in a straight line, but not less than 150 miles if we take into account the windings of the stream.

The very remarkable lake which receives the waters of the Jordan occupies the site of the plain of Siddim, where stood Sodom and the other cities which God destroyed by fire in the time of Lot (Gen. xiv. 3; xix. 24, 25). It is called by Josephus the Lake of Gennesareth, or the East Sea; the Romans called it the lake Asphaltites; and it now bears the name of the Dead Sea; it is called by the Arabs Bahr Lut. It is of an irregular oblong figure, lying nearly due north and south. The dimensions assigned it by Josephus are much too large; he gives 200 miles long by 120 miles wide, which is generally considered too large an estimate. The waters and surrounding soil are so intensely impregnated with salt and sulphur, that no trees or plants grow on its banks, and no cattle can drink of its water. The consequence is that it is supplied with water only by the Jordan, which is considered for it the name of the Dead Sea. It is said to contain no fish, but the accuracy of this statement is doubtful. Its surface is singularly still. The waters leave a saline crust on stones or whatever else they come in contact with, and
the drift wood upon it becomes so intensely impregnated with salt that it will not burn. It sends forth sulphureous and bituminous exhalations, and at some seasons of the year its surface is covered with a dense mist. The water is perfectly clear, and nearly of the same colour as that of the sea, but it is more salt and bitter, and of a much greater specific gravity. [Dead Sea.]

The following are the most important tributaries of the Jordan and its lakes. On the eastern side the Jarmouk (Sheriat-el-Mandur), the Hieromax of the Romans, and the Jabbok, [Bek) [both of which into the Jordan, the former entering it a little to the south of the lake of Gennesaret, the latter at a point about half-way between that lake and the Dead Sea; and the Arnon (Medjeb), which flows into the Dead Sea near its northern extremity, dividing Palestine from the land of Moab. On the western side, the brook Daphne, which flows into the lake Samochonitis; the brook which takes its name from the neighbouring town of Capernaum and flows into the lake of Gennesaret; the brook Arnon, which rises in the mountains of Ephraim and flows into the Jordan between the lake of Tiberias and the Dead Sea; and the brook Cedron, which flows from the Mount of Olives into the Dead Sea. The chief rivers which fall into the Mediterranean are the Belus, which flows into the modern bay of Acre a little to the north of Mount Tabor; the Kedron, which flows into the Mount Tabor through the plain of Jericho, and falls into the same bay at the foot of Mount Carmel; the Choroeus and Kanaah, which fall into the sea on the north and south of Caesarea respectively; the Jordan, which falls into the sea on the north of Mount Carmel and Escol and Besor, which fall into the sea near Askelon and Gaza respectively. The extreme southern limit of the coast is formed by the river of Egypt, which is supposed to be the brook El-Arish.

The climate of Palestine is warm and the weather is not very variable. There are, properly speaking, only two seasons. The winter lasts from October to the beginning of April, and is distinguished principally by continual showers, which are called in Scripture the early and the late rain. In summer, which lasts from September to September, there is a continuance of clear weather, with scarcely any rain; but very heavy dews fall in the night.

Population.—It is not easy to estimate the population of Palestine. A census taken in the time of David gave 1,400,000 souls who could bear arms (2 Sam. xxiv. 9), which would make the whole population amount to 5,000,000.

Political Divisions.—The political divisions of the country were very different at different periods of its history. The first notice we possess of the country is when Abraham came down from out of Egypt into the land of Canaan; he was then inhabited by the Canaanites, who were divided into the families of the Sidonians, the Hittites, Jebusites, Amorites, Gergasites, Hivites, Arkites, Sinites, Arvadites, Zemarites, and Hamites. Of these, the Sidonians inhabited the strip of coast along the Mediterranean, and were a sort of a middle class between the Egyptians of the Nile and the Meditelmarians, being a part of the district known in history under the name of Phoenicia (Phoenicia); the Hittites dwelt about Hebron; the Jebusites about Jebus or Jerusalem; the Amorites in the mountains west of the Jordan; the Gergasites about the upper part of the river Gennesaret; the Hivites in the country to the north of Shechem; the Arkites around Arad, and the Sinites near them; the Arvadites in the little island Arvad; the Zemarites and Hamites in the north of Syria, inhabited the seas coast in the south-west of the country. [Philistines.] At this period God promised Abraham that he would give the land to his descendants. [Jews.] This promise was fulfilled in the conquest of the land of Canaan by the Israelites, and the Promised Land was divided among the twelve tribes. Reuben, Gad, and the half tribe of Manasséh had their possessions on the east of the Jordan; the other tribes were located on its western side. Reuben was bounded on the east by Arnon, and on the west by Jordan; Gad, which inhabited part of the land of Gilead about the river Jabbok. On the north of Gad the half tribe of Manassëh extended to Mount Hermon and the sources of the Jordan. The whole of the southern part of the country, between the sources of the Jordan and the Mediterranean, was allotted to Judah; but this district being disproportionately large, the western part of it was given to Simeon and Dan. The small territory of Benjamin was bounded by Dan on the west, by Judah on the south, and by the Jordan on the east, and contained within its limits the city of Jerusalem.
the Jordan was Dan, more antiently called Laish, the most northern town of Palestine. In its immediate neighbourhood stood, in the time of the Romans, Cassarea Philippi, or Panias (Panias). At the point where the Jordan enters the lake of Gennesareth stood Bethsaida. This city was beautified by Philip, brother of St. Peter, and the residence of Herod, who called it Dio Cassarea; south-east of Sephoris was Nazareth (Nasarar). Near the source of the Kishon was Nain. The city of Esdraelon, the ancient Jezreel, was in the plain of the same name. West of it was Shunem. In the time of the Maccabees, Galilee was Bethanah, or Bethshan (Bisam), afterwards Sechopolis.

The most antient city of Samaria was the Shechem, or Sichem, of the Old Testament, the Sychar of the New, which Herod, after the death of his father, enlarged and beautified, who called it Sebastia, in honour of Augustus, which name it still bears. In the time of the Romans the chief city of Samaria was Cassarea Palestine (Kassaref), on the south bank of the Jordan, near the foot of Mount Gerizim, an infallible place called Tarrus Stratonicus. On the coast, north of Cassarea was Dora (Tortura); and near it En-dor; south of Cassarea was Apollonia (Om Khaled), a Greek town. To the south-east of this was Antipateria, formerly called Phaphos, and now the city of Samaria. This was Saron, whence the name of Sharon obtained its name.

The chief city of Judaea was Jerusalem, in the neighbourhood of which were villages of Bethphage and Bethany, on the Mount of Olives, and Emmaus (afterwards called Ebria), which was near Bethany, Mount of Olives, and Gethsemane. These were Aijalon and Gibeah; and farther to the north Ephraim and Luz or Bethel. To the east of Bethel, and in the north-eastern corner of Judaea, lay Joracho, which is sometimes called in Scripture Canaan, or the territory of the Philistines, which was, according to the historian of the Grecians, a small town; south of Jericho was Engedi. Bethlehem or Ephrathah (Batth el-laham) was about five miles to the south of Jerusalem. To the south of Jerusalem lay Hebron (El Khali). Joppa (Jaffa) was the principal city of the Antonus, and lay at the point of junction of the Phoenician and Arabian roads, and was connected by sea from the banks of the Alia, in the year of Rome 375, after which Præneste submitted to Rome by capitulation (Liv.), vi. 28, 29); but it is not said upon what terms, and we find in the next year that Præneste and other Latin towns were again in arms against Rome. (Liv.vi. 30.) More than a century and a half after this, Lucullus, in his wars against Mithradates, was at the head of seven towns or villages under its sway, which were taken by Cincinatus. Thirty years later, Præneste was included in the great Latin league against Rome, which was defeated by L. Furrus Camillus; the territory of the Præneste was conquered (Liv. vii. 43, 44), the city taken, and Præneste was sent to Rome like the rest of Latium. (Latini.) No colony however was sent to Præneste, and the inhabitants continued in the condition of a municipality without the Roman citizenship. In the civil wars of Marius and Sulla, and after the death of the former, the town of Præneste was given to the latter. In the great civil war of Sulla, took refuge within the walls of Præneste, when, being besieged by L. Offilia, one of Sulla's lieutenants, he tried to escape by a subterraneous passage; but finding himself discovered by the enemy, he ordered a slave to run through the bodyguard of the enemy. The town of Præneste ordered an indiscriminate slaughter of all the inhabitants. Præneste does not appear to have been destroyed, but it remained long after in a desolate state; and Cicero (De Leg. Agr. ii. 19) complains that a desert of a larger territory of Rome than any other territory of Rome continued to exist there. The Octavianus Caesar sent a colony of veterans to Præneste. The temple of Fortune was the great attraction of the place, and people repaired from all parts of Italy to consult the oracle, which gave its responses either by the voice of the goddesse or in written answers made out of characters stamped on dice, which were drawn from a urn by a child, and arranged in the shape of sentences by the soothsayers, or soothsayers attached to the service of the temple. (De Div. i. 16.)

The modern history of Palestine is more conveniently included under SYRIA. The only portions of it which demand a separate notice have been treated of under CRUSADES. At present the country forms a part of Syria, being included under the name of the Greater Syria, and forming part of the viceregalty of the pasha of Egypt. PALESTINA, the antient Præneste, a town in the Campagna, 20 miles east of Rome, built on the south-west slope of a high hill, which in a bend of the Appian road ascends to the summit of Mount Cavo; it is 1800 feet above the sea, and is 500 above the level of the upper waters of the Tiber, and 600 above the sea. This ridge is intersected by the river Anio, which forces its way through it, and falls in a cascade. From Tivoli the river runs in a south-east direction to Palestine, where it forms a pro-ecution terminating abruptly towards the south, but con-necting, by some undulating and wooded elevations, with the more southern group of the Alban Mount. These elevations, on which stands the small town of Zagorolo, which gives a dull title to the Roman family of Rospioglosi, form the watershed between the streams that flow westward to the Tiber, and that to the south to the Liris. The hill of Palestina commands a view of both valleys, as well as of the Pontine marshes to the south in the direction of Ausruta. In the mountains north of Palestina is the town of Poli, the antient Bols, and in the opposite range south of it is the papal city of Valmontone, the antient Vitelleia. Palestina is naturally a strong position, and has been fortified from the oldest times. The antient Præneste extended above the site of the present town, its citadel crowning the summit of the hill, and by its lofty position it deserved the epithet of 'frigidum,' or 'cool,' given it by Horace. There are some remains of the antient walls built of large irregular blocks of stone. A church, dedicated to St. Peter, has been raised on the site of the citadel. The town of Palestina is half way up the slope of the hill, on the site of the antient temple of Fortune, and about 700 feet above the sea. Palestina is a small town, with 3500 inhabitants, and some manufactures of coarse woollen cloth: it is also a bishop's see. The town is about half a mile long from east to west, and above the celebrated mosaic found among the ruins of the temples of Fortune, and transferred in 1640 by the Cardinal Francis Barberini to a hall of his mansion. It represents apparently an Egyptian festival on the occasion of the annual inundation of the Nile. Among the latter are the hippopotamus, the ibis, and the giraffe. The names of the various animals are expressed by the side of each in Greek characters. It is the finest and most perfect antient mosaic in existence. Some believe it to have been built in the time of Hadrian, others ascribe it to the reign of Hadrian. The latter is the opinion of Bartolommei, in his 'Dissertatio on the Mosaic of Præneste.' Præneste was a town of the Latins, and of older date than Rome. Tradition attributed its foundation to a certain Carus, who, according to Cato and Servius, was a leader of shepherds and robbers. In the war of the Latins against Rome after the expulsion of Tarquinius, Præneste is said to have forsaken its confederacy and allied itself to Rome. (Liv. vi. 19.) More than a century and a half after this, Præneste siding with the Volsci against the Romans, when the militia of Præneste advanced to the very gates of Rome, and occasioned a great alarm in the city. They were however defeated by the Roman forces, and Præneste compelled to pay a large sum of money. The Præneste, in the year of Rome 375, after which Præneste submitted to Rome by capitulation (Liv. vi. 28, 29); but it is not said upon what terms, and we find in the next year that Præneste and other Latin towns were again in arms against Rome, and were defeated, by Liv. vi. 30.) 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The greatest and most important of his works, 'The Principles of Moral and Political Philosophy,' was published in the year 1783. The general outlines of it had been delivered as lectures to his pupils when he was a tutor in the university. Though in some respects faulty, the work is most valuable addition to the literature of our country. His desire of introducing into the foundation of his system too much of the exactness of demonstrative science has occasionally led him to define things which in their nature are indeterminate, or to distinguish them in some respects in which they are of a precise and formal definition. His account of the law of honour and of virtue is of this character. Hence his applications are sometimes fettered and his conclusions defective. Both in his metaphysical and ethical views, very few of his ideas, overlooks innate capacities; and Paley denies the existence of a moral sense—of any faculty by which the mind is enabled to discriminate right and wrong.

This work was divided into two parts. The Moral Philosophy, and Tracts on Free Will. The first part, after giving some account of the law of honour, the law of the land, and the Scriptures, as rules of action; rejecting the notion of a moral sense, or innate capacity of moral judgment; and defining what he means by virtue, he proceeds to explain the principles and lay down the foundation of his system. This he does in book i., 'On Moral Obligation.' A man is said to be obliged when he is urged by a violent motive resulting from the command of another. The three sorts of motives are that of future reward or punishment, and the command is from God. Hence private happiness is the motive, and the will of God the rule. But how is the will of God known? From two sources—the declarations of Scripture, and the light of nature. The method of eradicating the idea of concerning any action, by the light of nature, is to inquire into the tendency of the action to promote or diminish the general happiness. Here then Paley arrives at his principle, that whatever is expedient is right. It is the utility of any action to be determined by the happiness of the person who performs it. The utility is to be determined by a consideration of general consequences; it must be expedient upon the whole, in the long run, in all its effects collateral and remote, as well as in those which are immediate and direct. Having settled the principle, he takes the most prominent part of moral duties. He takes a three-fold division of duties: viz. those which a man owes to his neighbour, or relative duties; those which he owes to himself; and those which he owes to God. The first set are determinate or indeterminate: or determinate because the promise of the person to whom the obligation is to be fulfilled is known; or indeterminate because the promise is to be fulfilled by the person to whom it is made. Contracts are mutual promises, and therefore governed by the same principles; consequently, whatever is expected by one person, is to be esteemed a duty by him; and if the contract be well founded according to the animus interiventis, i.e. in the sense which the imposer intends by them. Indeterminate duties are charity, gratitude, and the like. They are called indeterminate because the specification of equal limits can be fixed for the exercise. Another class belonging to this first set of duties originate from the constitution of the sexes. The second set of duties are those which a man owes to himself. As there are few duties or crimes whose effects are confined to one or to a few persons, so there are few duties or crimes whose effects are confined to himself consists in the care of his faculties and the preservation of his person, and the guarding against those practices which tend to injure the one or the other. The third division of duties are those which are due to God. In this division there is the divine will, whose some knowledge of which is the object as well as the author: these are worship and reverence.

The second part of this work is devoted to the elements of political knowledge. In determining the grounds of civil government, and the means by which it should be preserved. He finds in the right of property a natural foundation for the civil government. This right, as far as it is not inconsistent with the happiness of the universe, might be the object of the rights of a state. Paley, in the process of property. He holds the notion of a divine and insalvable right in kings to
govern, and the corresponding obligation of passive obedience in their subjects. They contend that God vested in Adam, the father of mankind, an absolute power over his posterity, and that this power descends without diminution to kings, the representatives of Adam. Appeals, on the other hand, supposes a Social Compact, a compact between the citizen and the state, as the ground of the relation in which they stand to each other; a mutual agreement as to the terms of the contract and the conditions on which one undertakes to govern and the other submits to be governed. The conclusive specific conceptions. He puts the divine right of kings on the same footing as the divine right of constables,—the law of the land. Against the Social Compact he urges that it is false in its premises, or pretended to be so, and that it is an impossible principle he assigns as the only reason of the subject's obligation to civil obedience, is the 'Will of God, as collected from expediency.' Public utility is the foundation of all government. Hence, whatever irregularity, or violations of expediency, are to be imputed to it, and whatever the acquisition of supreme power, when the state is once peaceably settled, and the good of its subjects promoted, obedience to it becomes a duty. On the other hand, whatever may have been the original legitimacy of the ruling power, the continued existence of the state, the safety of society, and the ease to satisfy the expectations of the governed, it is right to put it down and establish another in its place. After defining and giving some account of civil liberty, in which, as in every other part of his work, he adheres strictly to the principles of his own party, and to the consequences,—he proceeds to speak of the different forms of government, especially the British constitution, their advantages and disadvantages, the nature of crimes and punishments, and the administration of justice.

With respect to the last great question, whether, also, expediency governs all his views and conclusions. As no form of church-government is laid down in the New Testament, a religious establishment is no part of Christianity; it is only the wish of the majority that is increasing it. But the means must be judged of according to the ends. Of the mode of giving a public opinion, and the objects of the church establishment is founded in its utility. For the same reason tests and subscriptions ought to be made as simple and easy as possible; and the whole course is directed, to make the confessions of faith ought to be converted into articles of peace. In establishing a religion, where unanimity cannot be maintained, the will of the majority should be consulted, because less evil and inconvenience must attend this than any other. On the contrary, the supposition of submission and tolerance justified; because the former never produced any real change of opinion, whilst the latter encourages inquiry and advances the progress of truth.

The book ends with the subjects of population and prosperity, and the evils of the Roman establishment. "The final view," observes Paley, "of all national politics is to produce the greatest quantity of happiness." In legislation, in government, in levying war, this is the ruling principle; and in relation to these questions, as in every other, he thinks it would add to the visible testimony of God to the divine authority of that religion. Consequently, if the miracles alleged in behalf of Christianity were actually performed, the Christian religion must be the true one. Whether the miracles were actually performed or not, depends upon the credibility of those who professed to be witnesses of them, that is, the Apostles and first disciples of Jesus Christ; and their credibility is demonstrated from this consideration,—that they passed their lives in labour, danger, and suffering voluntarily undergone in attestation of the accounts which they delivered, and solely in connection with the existence of the belief in those accounts; that they also submitted, from that belief, not to new rules of conduct. They could not have been deceived; they must have known whether Christ was an impostor or not; they must have known whether the miracles he did were real or pretended; they would not have deceived the deceivers; they had no intelligible purpose to accomplish by denying their opinion, that men should set about propagating what they know to be a lie, and yet not only gain nothing by it, but expose themselves to the manifest consequences—enmity and hatred, danger and death.

The first great work of the new school, "Natural Theology," was published in 1802. Here, as in all the rest of his productions, the matter is arranged and the argument followed out with consummate judgment. His object is to establish the fact of benevolent design in the works of the visible creation. He cites the evidence of the physical sciences; and the inference is inferred; and his personality, unity, and goodness demonstrated. It is not only one of the most convincing, but one of the most delightful books in the English language. "One knows not," says an ingenious writer, "which to admire most, the natural science or the moral ethics. The dispositions of the materials, the suitableness of the style, the skilful management of the general argument, the decisive refutation of the several atheistic schemes, or the impressive and magnificent demonstration in which it concludes." A valuable and important edition of the work, with notes and scientific illustrations, was published a few years since by Lord Brougham and Sir C. Bell, the former furnishing a preliminary discourse of natural theology. The first part of this new edition is devoted to an exposure of the nature and character of the evidence on which natural theology rests, with the intention of proving that it is as much a science of induction as either physical or mental philosophy; and the second is devoted to a consideration of the advantages and pleasures which the study is calculated to afford. Subjoined to the volume are some notes on various metaphysical points connected with the subject.

Besides these works, Paley was the author of various sermons and tracts. Of his works published during his lifetime, an edition, by Lyman, appeared in 1825. A complete edition, in 4 vols., containing posthumous sermons, was published by his son the Rev. Edmund Paley, in 1838. PALMINTON. [vol. xii., p. 223.]

PALIGHAT. [Hindustan, p. 204.]

PALIMPEST MANUSCRIPTS (παλιμπήστα τυπάδια) are manuscripts from which the original writing has been erased or washed out, and which have been then written on again. This process is ancient, as is shown in the time of Cicero, as appears from a letter of his to Trebutius (Ad Fam., viii. 19), in which he praises his friend for having been so economical as to write on a palimpsest, but says that he should like to know what those writings had been, as no evidence of their importance than a letter. (Compare Martial, xiv. 7.) The scarcity and expense of parchment, and the demand for the writings of the fathers and books of devotion in the middle ages, frequently induced the monks to erase or wash out the old writings, and use the leaves for the writing of the books of the fathers. In many cases however they were not able to obliteratively entirely the antient writing; and a careful examination of some of these palimpsest MSS. has led to the discovery of some valuable works and fragments of the classical authors. Among these are some MSS., the fragments of which contain the treatise of Cicero, "De Republica," which was found in the Vatican library at Rome by Angelo Mai in a MS. which had been re-written with the commentary of St. Augustine on the Psalms. The Institutions of Gaius were recovered in a similar manner in the library of the chapter of Verona. The original MS. which contained the Institutions had been erased, as far as was practicable, and
had been re-written with the works, chiefly the epitaxies, of St. Jerome. [GALUS; PARCHMENT.]

PALINURUS (Zoology), the name given by Fabricus to a genus of crustaceans which forms the tribe of Langostones in the system of M. Milne Edwards, being the third of his family of Cistronatus Morcucians, and characterised by the existence of antennæ of the ordinary form and the absence of didactic pincers.

The Palinurus, or Sea-crawfish, as they are popularly called, have the body nearly cylindrical. Their carapace is nearly straight from before backwards, very convex transversely, and presents about its anterior third part a deep transverse furrow, which is directed forward on each side and separates the stomochial from the cardiac and branchial regions, the only ones which can be well distinguished. The anterior border of the carapace is armed with two stout horns, which advance above the eyes and the base of the antennæ. On each side, below the eyes and nearer to the base of the external antennæ, there is a more or less strong tooth. A great number of spines also nearly always arm the cephalothoracic buckler, over whose surface they are disposed. The ophthalmic ring is free and exposed; the eyes are large, short, and rounded. The antennular ring is very much developed, and advances between the external antennæ, below and in front of the ophthalmic ring; sometimes it is triangular, and much longer than it is wide, and sometimes it is nearly square. The internal antennæ, which spring from the lower part of its anterior border, are very long; their first joint is entirely cylindrical, and so are the two next joints; they terminate by two multi-articulate filaments of varying length. The external antennæ are very stout and very long; their basilar joint, in which the auditory apparatus is lodged, is very large, and is joined to its conger so as to form in front of the mouth a very large epistome; the three succeeding joints are stout, moveable, and thorny; they constitute the basilar portion of the antennæ, and are succeeded by a multi-articulate stem which is very stout and very long. The external jaw-feet are small and pediform; their internal border is only a little or not at all toothed, very obtuse, and furnished with bundles of hairs; their palp is very small or entirely wanting, but they give insertion to a large flabelliform joint. The second pair of jaw-feet are small and vary in the form of their palp; the first pair have a very large palp, which completes the different branchial canal forwards, and terminates sometimes by a styloform appendage, sometimes by an oval blade in the form of a spatula. The mandibles are very stout, their edge is tranchant, and their palpiform stem is very slender. The internal pleuron is of large size and composed of five segments joined together; it is very narrow between the first pair of feet, but is enlarged from before backwards, and presents on reaching the penultimate pair a very considerable width. All the feet are monodactyle; the first pair, which are in general shorter and a little stoutier than the others, terminate by a short stout finger, which is not very moveable; sometimes there is at its base a spine, which as the vestige of a thumb, while these organs are never even subcheliferous. The third pair of feet are, in general, longer. The abdomen is very stout and very long; its first ring has no appendages, but each of the four succeeding rings gives insertion to a pair of false feet, composed, in the male, of a small basilar joint and a large oval terminal lamina, whilst in the female there are two similar laminae, or at least a single lamina and a stemlet which is biarticulate and furnished with hairs. The caudal fin, formed by the seventh abdominal ring and the appendages of that which precedes it, is very large, and each of the laminae of which it is composed remains flexible and half-horny for its two posterior third parts, whilst above it is crustaceous like the rest of the tegumentary skeleton.

The branchiae are composed of cylindrical filaments, which are short and close after the manner of a brush; there are eighteen on each side—two above the second jaw-foot, three above the external jaw-foot, three above the anterior foot, four above each of the succeeding feet, and one above the fifth foot. A large flabelliform appendage elevates itself between each of the bundles of branchium. (M. E.)

The genus is composed of species of considerable size, remarkable for the hardness of their crusts, and spread over all seas. Rocky coasts are their favourite haunts.

M. Milne Edwards divides the genus into the two following sections, and places the tribe which they constitute between the Scyllarians [Scyllarins] and the Thalassinians [Thalassinians].

1. Ordinary Palinuri.

Distinguishable by the existence of a small, more or less projecting, median rostral tooth on the frontal edge of the carapace; a very narrow annular ring, so that the external antennæ touch each other at the base, and cover the internal antennæ, which terminate by two very short multi-articulate stemlets.

Example, Palinurus vulgaris.

Description.—Lateral horns of the front smooth above
and armed below with many sharp dentilations; carapace very spiny; suborbital teeth on the border of the carapace very large. Abdomen almost entirely smooth, and presenting on the four rings which succeed the first, a transverse, deep, and hairy furrow, invested on the median line; the lateral posterior horns formed by the angles of these rings, armed on their posterior border with three or four teeth situated near their base; two last rings of the abdomen spiny. Internal antenna very slender and of moderate length. Anterior feet short and armed with the extreme of the lateral horn, and a slender biarticulate appendage. Colour violaceous-brown spotted with yellow. Length about 18 inches. Weight sometimes from 12 to 15 lbs.

This appears to be the Kapádsoc (Carabus) of Aristotle and the ancient Greeks, and the Locusta of the ancient Italian authors (Suetonius, &c.) and of Belon. In the Portrait of Opepeux, &c., observe par P. Belon du Mans (1567), is a cut of the crustacean, and under it the following lines, which allude to its name (Locusta), derived probably from its power of springing with the tail or abdomen—

On petit nommer Sensabelle de mer
Crete Langouste, estant par lout piqante
Descors le dos, Dieu la feut per pulissante,
Mai la sevet de dire essonce armée.

It is the Common Sea-crawfish of the shops, Langouste of the French.

Locality.—The seas of Europe. Common on the rocky coasts of Britain, especially in the south, and on the like coasts of France, especially on the south and west.

Utility to Man.—In general use as an article of food when in season, and as wholesome as the lobster; but though M. Milne Edwards states that the flesh is very much esteemed, the English specimens are certainly far inferior both in tenderness and delicacy of flavour to that of the last-mentioned crustacean.

The Pulinurus Rissoii of M. Desmarets (green with white and reddish spots on the carapace and white lines on the abdomen), erroneously referred to Pulinurus fasciatus, is in the last work of that naturalist (Hist. Nat. de l'Europe Médir.) considered as a mere variety of Pulinurus vulgaris.

Three other species of Pulinurus are arranged by M. Milne Edwards under this section. Their localities are stated to be the Cape of Good Hope, Chili, and the Antilles.

2.

Long-horned Pulinuri.

No vestige of a median row seen on the anterior border of the carapace; antennular ring very large and nearly square, so as to separate considerably the external antenna, and to leave exposed the internal antenna, which are terminated by two very long multi-articulate stemlets.

§ Abdomen not furrowed.

Example, Pulinurus fasciatus.

Description.—Antennular ring armed above with two conical rather large teeth situated near its anterior border. Carapace armed with a small number of spines, and slightly granular, or only dotted on its posterior half; lateral tooth of the anterior border of the carapace small; no spines on the median line of the stomachal region; median tooth of the anterior border of the epistome very large. Terminal appendage of the internal jaw-foot oval. Abdomen smooth, finely dotted, and without transverse furrows; two or three small teeth towards the upper part of the posterior border of the lateral horns of the four abdominal rings which succeed the first. Feet slender. Colour greenish, with white sinosus spots on the thorax, a white band near the posterior border of each abdominal ring, and many longitudinal whitish lines on the feet. Length about a foot.

Locality.—India, from the coast of St. Helena and the Isle of France, and the other P. sulcatus, from the coasts of India, come under this section. The latter may be, in the opinion of M. Milne Edwards, only a variety of the former.

§ Abdomen furrowed transversely.

Example, Pulinurus guttatus.

Description.—Antennular ring armed with two very large conical teeth, sometimes preceded by two rudimentary spines. Carapace very spiny; two spines on the median line of the stomachal region near the base of the rostral horns; and on each side of these last, on the anterior border of the carapace, two teeth nearly as large as itself. Anterior border of the epistome armed with three nearly equal conical teeth, separated by a series of dentilations. Second pair of feet rather longer than the others. Abdomen smooth, and presenting towards the middle of each ring a transverse pilerous ring, which is not interrupted on the median line in the two first segments. A single tooth behind the base of the lateral horns of the abdomen. Colour green, with many circular yellowish spots; penultimate joint of the feet striated longitudinally with green and yellow, a length again to eight inches.

Locality.—The Antilles.

Five well-marked species from the seas of warm climates are also placed in this subsection by M. Milne Edwards, who observes that there is in the Paris Museum a foot of a Pulinurus, which came from the Isle of France, appearing to belong to the third pair, and remarkable for its large proportions. This specimen leads to the presumption that there exists a gigantic species unknown to naturalists. The foot in question is more than two feet (French) in length.

Fossil Pulinuri.

M. Desmarets (Crust. Fori.) notices a large fossil crustacean from Monte Bolca, which evidently belongs to this genus, and is nearly of the same proportions as Pulinurus vulgaris, but it is not sufficiently well preserved to identify the character.

M. Milne Edwards further observes that M. Desmarets refers to this genus two other species of fossil crustacea, but the former zoologist does not agree with the latter in opinion as to the relative affinities of those animals. Pulinurus Regelus (Desm., Crust. Fori.) appears to M. Milne Edwards to have more analogy with the genus Nephrops than with any other macrurous crustacean; and Pulinurus Suerti (Desm., loc. cit.), though evidently belonging to this family, does not, according to him, deserve to be considered as a true Pulinurus, because the disposition of the regions of the carapace is very different. The upper part of the shell, instead of being divided into two portions only by a deep furrow situated in front of the branchial regions, is divided into three bands, the posterior of which is formed by the branchial regions, the anterior by the stomachal region, and
the middle one by the highly developed hepatic or genital regions. There is also between this last portion of the carpace and the branchial regions a species of triangular shield, which represents the cardiac region. The disposition of the rostrum is not observable, and it seems to M. Milne Edwards that when this fossil is better known it will form a distinct genus. It is from the muschelkalk.

M. Milne Edwards is also of opinion that the *Macrourites pseudocorallaeus* of Schlotheim, a fossil crustacean of singular structure, ought to be arranged under the family of *Ceratocystidae*. The type species of this new genus is a micrognathous crustacean, for a rostrum and palps and a well-developed gill-case, and the appendages are slender, and have an elongated peduncle. The first pair of feet are very stout, and spiny for two-thirds of their length, but appear to be terminated by a small nearly filiform digitule at the end. The succeeding feet are short, slender, and monodactyly. The abdomen is large, and nearly coniform with that of the *Palinurid*. One of the fossil Macrourites, he adds, figures in the *Ornithographia Nova* (p. 8, l. 7), approaches nearly to the preceding.

(Wells, Nat. des Crust.)

PALIURUS ACULEATUS, or AUSTRALIS, the *Palus* of the modern Greeks, is a small shrub, with flexuosus shoots directed almost horizontally from the principal stem, and armed with short stiff curved spines, which grow in pairs from the base of the leaves. It has small shining oval leaves, yellowish, green clustered flowers, and a broad brown fruit, convex in the middle, but thin and uneven at the margin. It is common in the south-east of Europe and in Asia Minor, and is supposed to have been the plant from which the Jews platted the crown of thorns for our Saviour. In this country it is not uncommon in shrubberies, where it forms a beautiful bush when in flower, but it does not ripen its fruit. It is supposed to be the third sort of *Palus* mentioned by Dioscorides, who compares the form of the fruit to that of a vertebra; so the *Palus* of this author must have been something else, and perhaps, as Sibthorp conjectures, the modern *Zips*, *Ziziphus vulgaris*, or *Jujube*.

of two subdeacons of St. Peter's Church, who put them on to grass, and in due time sheared them; the wool obtained from these lambs, being mixed with other wool, is spun, and afterwards woven into these cloths. Thus woven, they are carried to the bodies of St. Peter and St. Paul, and after certain prayers said, are left with them all night. The next morning they are received again by the subdeacons and laid up till an archbishop who requires one of them comes either as a person or by his proctor to demand it. The price at which they are purchased from the pope, he adds, is considerable; nor is it useful for an archbishop to use his prebend in a pall. If by exchange, or in any other way, a patriarch or metropolitan is removed to another church, although he had purchased a pall before, he must still be at the charge of a new one. Before the receipt of his pall, an archbishop cannot perform the functions of his office even if he has been translated; nor can the archiepiscopal cross be borne before him.

The original grant of the pall from Pope Julius II. to archbishop Warham is still preserved among the Connexae construction. The form is: 'Ad honorem dei omnipotentis, et beati Marci Virginis, et beatorum Apostolorum Petri et Pauli ac de minimis nostri Julii, pp. ii. et sanctae Romanae Ecclesiae, neeone sacerdotum principalium legantur, et suis promittimus ad corpus et sanguinem beati Petri summum, plenitudinis videlet postficialis Officii, ut utar si infra Ecclesiam tuam certi debes qui exprimatur in privilegii ei ab apostolica Sede concessas. Abiatus.'

Pallium. A pallium is called omophorion (ομοφορία), and has been used at least since the time of Chrysostom, who was charged with accusing three deacons of taking his omophorion. (Photii Bibliotheca, ed. Par. 1611, p. 53.) It is worn by all the Eastern bishops, above the phelonion, or vestment, during the eucharist; and, as used by them, resembles the antient pall much more nearly than that worn by Western metropolitan, approaching nearer to the shape of a cope.

(Du Cange, Glossar., v. 'Pallium.' Picart's Religious Ceremonies, ii. 315, 316.)

PALLA'CO'PAS. [Tigri.] PALLADIO, ANDREA', an Italian architect whose name has become almost proverbial through Europe, and whom many critics still consider one of the greatest masters of his art, more especially in all that appertains to taste. He was born at Vicenza in the Venetian territory, a city which is distinguished by the numerous structures with which he adorned it. Of his family, his early youth, and his first studies, scarcely anything is known. It appears however that he studied with great diligence the writings of Vitruvius and Alberti, and that he found an encouraging patron in his countryman Gian-Giorgio Trasino, who, in his name still holds a conspicuous place in the history of Italian literature. He visited Rome three several times, and he turned these opportunities to such excellent account that scarcely an antient edifice of any note escaped his examination, while of many of them he made drawings and studies, and carefully noticed their construction.

He appears to have returned from the last of these journeys in 1547, when he was in his twenty-ninth year, and to have settled at Vicenza. His first work, or rather one in which he had the largest share, was the Palladio, which was begun by Giov. Fontana, a Vicentine architect and sculptor, and by some supposed to have been Palladio's instructor; but the first work of any importance entirely designed by himself was the Basilica or Palazzo della Ragione at Vicenza, a large antient Gothic structure, which he entirely remodelled. He surrounded it on three sides by open loggias or portico, forming two orders, Doric and Corinthian, in half columns, each including a smaller order of insalated columns whose entablature forms the most elaborate decoration which has been put upon the greater intercolumns. So great was the reputation be at once acquired by this edifice, that he was shortly after summoned to Rome by Paul III., who wished to consult him respecting the works then in progress at St. Peter's. He returned to Vicenza, which at that time was the metropolis for the fourth time, but Paul died before he arrived there.

On his return he seems to have been overthrown with commissions, almost every one in Vicenza and its neighbourhood, who could afford to build, employing him to
design them a mansion or villa, of which class of subjects the
majority of his works consists. Though he executed com-
paratively few structures of great magnitude and im-
portance, he had numerous opportunities for displaying his
invention upon a moderate scale, and creating a style of
domestic architecture still unknown—which is probably one rea-
son why he has so generally been taken as a model by architects of other countries.

Among the numerous private mansions erected or designed
by him at Vicenza are the palazzi Tieche, Valmarana, Chiericati, and others. Posteminent among these is the
celebrated Villa Capra or Rotonda at a short distance from
the city, besides a great many villas and country-seats along
the Brenta. But some of the mansions at Vicenza have
never been completed, and others too evidently attest either
the poverty or the excessive negligence of their present
possessors.

The reputation acquired by these and similar works led
to Palladio's being invited to Venice, as Sansovino, the chief
architect was, growing infirm. Here, at first employed with some success by the convenant Delia Carne
consisting of a Corinthian atrium, and a cloister beyond
it. This atrium is merely an open court about 42 feet
wide by 56 in depth, with a colonnade of four Corinthian
columns in antis. On the one hand the court, and on the other the two
cases is the entrance to what were affectedly called Tablini,
which were merely two tolerably spacious rooms, one
intended for the sagacity, the other for a chapter-house.
The atrium just mentioned communicated immediately,
through a curious extraordinary and ornamental door to
the court or cloister, about 80 by 66 feet, whose elevations pre-
sent three orders, viz. a Doric and Ionic with open arches
between the columns (six each of the longer, five on
each of the shorter sides), forming open galleries quite
round, with a porch above, the sides of which are of
rather small proportions. Two churches afterwards erected
by him in the same city afforded him an opportunity of dis-
playing his talents in buildings of that class. The first
of them, San Giorgio Maggiore, was begun in 1556, though
the nave and its striking portico, the main feature of the
church as a nave with two aisles, but so short in proportion to the rest,
there being only three arches on each side, that the whole
approaches to the form of a Greek cross. Of decoration too
there is very little besides columns and entablatures, and the small columns and pilasters forming the altar tabernacles;
even the vaulting and dome being quite plain, with
merely arcade-doubleaux formed by the upper semicircular
windows. The front has a large composite order of four
duchess columns supporting a pediment, and placed on
large pedestals, majestic and imposing. Two pilasters on each side, surrounded by a half pediment,
the horizontal cornice and rest of their entablature being
continual as a facia between the larger columns. Yet although
there is no lack of decoration, the intercolumns, except the
cornice, the architrave, and the triglyphs, are plain to
the upright, with an arch over it), being filled by niches and pannels,
and there being, besides, festoons between the composite capitals,
the architecture itself is by no means rich; none of the
chief angles are curved, and the modillons of the cornices
are mere blocks. The same may be said of the still more
celebrated church called Il Redentore, begun in 1578,
about two years before the architect's death. In description
the facade of this edifice agrees very nearly with that of the pre-
ceding, and its architecture is of the same order as the
lesser Corinthian one, with half pilasters. At the
same time there are considerable differences, for instead of being
raised upon pedestals, the larger order stands upon
the platform of a flight of steps occupying the centre division
to the right and left. This platform consists of two half-columns and two pilasters. The
portions again are quite dissimilar, owing to the omission of
pedestals, the greater width of the intercolumns, and the
relative size of the two orders, the Corinthian one being
considerably less elaborated by a simple order of half columns.
The cornice of its entablature is nearly level with the top of
the shafts of the larger columns, whereas at S. Giorgio the
smaller cornice is not higher than two-thirds of the larger
columns. Neither is the lesser entablature here continued
through the intercolumn, where there are two Corinthian half-columns
to the door, surmounted by an entablature and pediment,
besides which there are smaller columns and segmental
pediments to the niches in the lateral divisions of this centre
compartment. All these different columns, pediments, and
half-pediments tend to produce quite as much monotonous
as variety. In its plan this church greatly surpasses the other,
having a good deal of play and elegance in its arrangement,
and being more imposing in its proportions. Still here, again,
the order itself constitutes the whole substance of the architecure, the rest being bare and cold, and plain almost to nakedness.

The facade of San Francesco della Vigna was also de-
signed by Palladio in 1562, although the church itself is
said to be by Sansovino. This front is very much like that of St. Giorgio,excepting the ground plan of a semicircular window (in three compartments, or of the kind
called a Palladian window) over the doorway, also a circular sculptured ornament within the pediment, and an inscrip-
tion on the frieze.

One of his last if not his very latest work was the Teatro
Olimpico at Vicenza, which he did not live to complete; for
he died August 6th, 1580, at the age of sixty-two, and that
structure was not entirely finished till 1588. It has been
extravagantly extolled by many, and severely condemned by
some. The oval ground plan of the theatre was a success;
in small spaces it is, in modern usage, quite agreeable.

It may indeed be asserted of Palladio's works generally that
they have been greatly and indiscriminately overpraised
by successive writers, who seem to have merely repeated one an-
other. Among the many who have extolled Palladio's
architecture, but without knowing how to show wherein they consist, are the names of Goethe, Quatremère de
Quincy, Forsyth, Hope, and Beckford.

Judging Palladio dispassionately, it is impossible to
deny that his works abound with defects and solecisms that
would hardly be tolerated in any other period of the
engaged columns and matters of that sort belonging to the
system itself, nor of the dryness and littleness of manner fre-
quently resulting from an order being adapted only to a single
floor of a building, one consequence of which practice is that
inward stress is large. In addition to these defects proportion that should be observed between the columns
and the windows is almost lost sight of; but we speak of
such positive errors as windows cutting into architraves,
windows within friezes, doors lower than windows, figures
on the side cornices of architectural groups, &c.; speaking of
some of the best examples of the Ionic order, and above all a dryness, mannerism, and
monotony of detail. As regards Palladio himself, there may
be much excuse for his errors, but certainly none for the
prejudices of those who would now insist upon scoring
Palladio for works which are more particularly as nothing
is easier than for a modern architect to avoid his faults, and
even to improve upon his beauties.

PALLADIUM, a metal discovered by the late Dr. Wol-
aston in the grains of native platinum, first in the year 1803,
in these it exists to the amount of only about 1 per cent.
He afterwards found it in the platinum sand of Brazil,
in nearly pure grains of a diversely fibrous texture, by
which they are distinguishable from platinum. According to Brest-
head's account, the platinum sand of Siberia consists of
native palladium, which are flat and of a silver white
colour. In the opinion of Levy, the primary form of these
grains is a cube, their specific gravity varies from 11.8 to
12.14, and they contain very minute quantities of platinum
and silver. It is metallic, but not easily oxidised; it is
from silver white to steel grey; they scratch iron readily.
Palladium is usually obtained from the solution of the
grains of platinum in aqua-regia, by the addition of oxygen of mercury after the greater part of the platinum has been extracted. A bar of palladium, in a crucible, is placed in a cyanide of palladium the metal is separated by a process
which is tedious and rather complicated.

The properties of palladium are, that its colour is greyish
white; it is very malleable and slightly elastic. It is not
as difficult of fusion as platinum. It is hard. It does not
oxidise by exposure to the air.

Oxygen and Palladium have but little affinity for each
other, and though palladium acquires a black film when
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exposed in the air to a strong heat, the oxidizmation is so superficial, that no increase of weight can be ascertained. By the action of acids however, and especially of chlorine, it is converted into an oxide.

Prooxide of Palladium.—When carbonate of soda is added to a solution of the chloride or nitrate of palladium, brown hydride of the prooxide is precipitated; and when this, after standing in the air and heated, the water is expelled, and black oxide remains. When the nitrate is decomposed by heat, the same oxide is also procured; but if it be very strongly heated, it then loses oxygen; and it is not easily dissolved by acids after it has lost its water. It is composed of—

One equivalent of Oxygen = 8
One equivalent of Palladium = 54

Equivalent = 62

Binoxide of Palladium is formed when a solution of potash is gradually poured on the double chloride of potassium and palladium in a dry state; by this is separated a compound of water, potash, and binoxide of palladium, which dissolves in an excess of the alkali; but the solution soon becomes gelatinous, and deposits a great part of the oxide combined with the potash. This, after washing with boiling water, abandons the greater part of its water, and becomes black anhydrous binoxide of palladium; when strongly heated, it loses oxygen; it dissolves with difficulty in oxalids, and with dilute hydrochloric acid it yields chlorine. It is composed of—

Two equivalents of Oxygen = 16
One equivalent of Palladium = 54

Equivalent = 70

Protoclouride of Palladium is obtained by evaporating a solution of palladium in aqua regia to dryness. It is a brown crystalline substance containing water, and becomes black when the water is dissipated. It is soluble in water; and, when the dry salt is strongly heated, chlorine is expelled. It consists of—

One equivalent of Chlorine = 36
One equivalent of Palladium = 54

Equivalent = 90

Bichloride of Palladium exists only in solution, and is procured by digesting the protoclouride in aqua regia; the solution has a very dark colour. With chloride of potassium it yields a double chloride of a red colour, whereas the protoclouride yields a yellow double salt.

Carburet of Palladium is obtained by heating palladium foil in the flame of a spirit-lamp. This carburet is black and easily reducible.

Sulphuret of Palladium is of a greyish white colour and metallic lustre. It is fusible and is decomposable by heat. This compound is readily formed by heating its elements with the evolution of light. When decomposed by heat, it yields a brownish powder, which appears to be a protosalphide of palladium, which is dissolved by hydrochloric acid, and when strongly heated is converted into metallic palladium. It consists of—

One equivalent of Sulphur = 16
One equivalent of Palladium = 54

Equivalent = 70

Phosphuret of Palladium.—Phosphorus forms a fusible compound with palladium.

Alloy of Palladium.—This metal forms alloys, most of which are brittle, with arsenic, iron, bismuth, lead, tin, copper, silver, platinum, and gold; the alloy with nickel is ductile. A liquid amalgam is obtained by agitating it in a large quantity of mercury in a sealed tube. The palladium, if the palladium precipitated by the mercury is in excess, a black metallic powder is obtained, formed of 48.7 parts of mercury and 51.3 of palladium; the mercury cannot be extracted from this compound, even at a white heat. Palladium, when fused with 6 parts of gold, destroys its own weight, and this alloy was proposed by Dr. Wollaston for the graduated part of the mural circle of the Greenwich Observatory.

Salts of Palladium.—Nitrate of Palladium is obtained by treating it with nitric acid; the action takes place slowly unless assisted by heat, and the solution is of a red colour; by evaporation a red mass is procured, which is probably a subnitrate; the precipitate which it yields on the addition of evaporated sulphuric acid is a coagulating compound.

Sulphuret of Palladium is formed by diving the metal in sulphuric acid, or by decomposing the nitrate with it. It is a red soluble salt which is but little known.

Palladium has, of all metals, the greatest affinity for oxygen. When the system of palladium, oxygen, and water is carefully precipitated from all its solutions, which gives an easy method of separating it from other metals; when the cyanide of palladium is heated, it is decomposed, and the palladium remains in its metallic state.

Most of the salts of palladium are soluble; those which contain the binoxide are little known; those of the protoclouride are red or yellowish brown, and their solutions are of an intense yellowish red. Potash precipitates protoclouride of an orange colour, and sulphuretted hydrogen precipitates them of a deep brown. The protosalphide of iron and the metals which precipitate platinum throw down palladium in the metallic form. Ferrocyanide of potassium forms a yellow precipitate in the solutions of palladium, which is a cyanure of iron and palladium; the cyanide of mercury precipitates a colourless cyanure of palladium. Protosulphuret of tin renders the solutions of palladium opalescent, and gives a brown precipitate; but when they are sufficiently dilute, the colour becomes of a fine emerald green.

PALLADIUS, one of the Christian fathers, was bishop of Heraclea in Bithynia, a Greek work containing the lives of certain persons in Palestine and Egypt who made themselves remarkable at the times when he wrote by their religious austeritys. This work was called the 'Lausiac History,' from Lausus, an officer in the imperial court of Constantinople, to whom it was dedicated. It is published in the Bib. Poly. Moret., Par. 1644.

According to Cave, Palladius wrote his history about 421, in the fifty-third year of his age. We know nothing more of him, except that he was an Origenist and an admirer of Rufinus, and who preached very strongly against Jerome.

There was another writer of the same name, who composed a Dialogue of the Life of St. Chrysostom, at Rome, in the year 408. It is not known whether he is the same as a different person from the former. Du Pin thinks him the same; Tillemon and Fabrius supposed he was another person. His 'Dialogue' is published in the best editions of Chrysostom's works.


PALLADIUS (Palladius), generally surmised 'Sophista,' or 'Iatrosophista,' the author of three Greek medical works still extant. Nothing is known of the events of his life, but he is supposed to have gained his title of Sophista by having been a professed physician at Alexandria. His age is also very uncertain; but he is stated by Galen (De Fœbr., pp. 6, 8, 12, 56, ed. Bernard), and by himself several times mentioned by Rases, we may safely place him somewhere between the beginning of the third and the end of the ninth century. From his 'Hist. Physic,' argues that he must have lived after Aetius, because the chapter 'De Epilix,' in his treatise 'De Fœbris,' taken word for word from that author; but this argument is by no means conclusive, because (as Bernard remarks in his preface) that the very same work is quoted by Galen (De Different. Fœbr., lib. ii. cap. 6), from which it is probable that both authors borrowed the passages in question. The first of his extant works is entitled 'De Aurum et Ferro Aurum,' and consists of thirty chapters, and contains an account of the different kinds of fever (cap. 4, &c.); its causes (cap. 9), and its symptoms (cap. 10): it then treats separately of the different kinds of fever (cap. 14-18), and similarly of the intermittent (cap. 19-23); and finally, in c. 27, shows how the treatment is not too short to be of much value, and almost the whole of it is to be found in Galen. Aetius, and Alexander Trallianus. It was first edited by Charlier, 4to., Gr. and Lat. (Paris, 1645); the last and best edition is by J. B. Bernard, 4to., Gr. and Latin (Paris, 1743). It is stated by many that though there are several MSS. of this treatise in different public libraries, not one of them bears the name of Palladius; but in some it is ascribed to Stephanus, in a MS. in Thessaloniki, and in others to both. It is however, in the opinion of Fried (Hist. der Physic) and Bernard (Prof. Ant.),
Inclination of the orbit to the ecliptic 34° 38' 29". Long. of ascending node 121° 42' 51". From the mean. Long. of perihelion 172° 38' 5' 49". Mean of the equinox of the Mean Longitude 55° 30' 5". Epoch, 1789. Mean daily sidereal motion 768° 54588.

PALLAS, PETER SIMON, was the son of a surgeon at Berlin, where he was born on the 22nd of September, 1741. He was brought up to the medical profession, and instructed in the natural and medical sciences, in which he made rapid progress. He had also a great talent for learning languages, which he found of advantage to him in after-life. While very young, he imbibed a taste for zoology, and to this science which became the sole occupation of his life he devoted all his leisure time. In 1758 he went to the university of Halle, and he afterwards visited those of Göttingen and Leyden. At Leyden he took his doctor's degree, on which occasion he wrote an inaugural dissertation on intestinal worms. Zoology had now become his ruling passion, and he employed almost all his time in visiting the different museums of natural history, for which Leyden was at that time particularly celebrated. In July, 1761, he came to London for the avowed object of studying medicine, but in reality for the purpose of examining the different collections of animals in this country, and making himself acquainted with the natural productions. He remained in London nearly a twelvemonth. In 1763 he obtained his father's permission to settle at the Hague, where, in 1766, he published his 'Elencus Zoologicus,' a work of great talent and ability, which he intended to publish, but found the MS. so corrupt, that he was obliged to give it up. Pallas appears to have been well known to the Arabians, as, besides being quoted by Rases, he is mentioned among other commentators in the meditations of 'Liber Philosophiae Biblioth.,' quoted in Casirii, 'Bibliothe. Arabico-Hisp. Escu.,' t. i, p. 237.

PALLANZA. [Novara, Vall Dl.]

Pallas, the second in order of discovery, and the first that was clearly ascertained to be the work of Palladius, as he refers to it in another of his works entitled 'Ecce utem toti genitorum femina. In Sextium (Hippocr.) Epidemorum Librum Longinum, de Mortu, 3486, 3497, and goes no farther than the seventh section, with a few fragments of the eighth. In (it says Freind) he, with great perspicuity and exactness, illustrates not only Hippocrates, but also several passages of Galen; and observes particularly that the stone increased much in his time, and was less curable; and this he imputes to the luxury of the age, to much eating, and want of exercise (sect. i. p. 5, 19, ed. Dietz). It was first translated into Latin by J. P. Crassus, and published after his death, Basel, 1591, 4to, in the collection called 'Medici et Medico-sapientum,' vol. 2, fol. R. Diez, 1838. The third work by Palladius is entitled 'De Clinia et Mortu. de Clinia, et Malatu. Scholia in Librum Hippocratis de Fractura.' This also is imperfect; but, in Freind's opinion, what remains is enough to let us see that we have not great loss by it, the text being as full and as instructive as the annotations. They were translated into Latin by Jac. Sentstenius, and fire inserted, Gr. and Lat., in the edition of Hippocrates by A. Foerius, Francof., 1595, fol. sect. v. p. 196-212; and in that of Hippocrates and Galen by Chytrar, tom. xii., pp. 278-298. Dietz, in his preface, mentions another work by Palladius which he found in MS. in the library at Florence, of which he was informed by one of the library, to which he intended to publish, but found the MS. so corrupt, that he was obliged to give it up. Palladius appears to have been well known to the Arabians, as, besides being quoted by Rases, he is mentioned among other commentators in the meditations of 'Liber Philosophiae Biblioth.,' quoted in Casirii, 'Bibliothe. Arabico-Hisp. Escu.,' t. i, p. 237.

Elements of Pallas's Orbit.

Epoch 1837, October, 14th, mean astronomical time at Berlin.

Semi-major axis 2:77263, that of the earth being assumed 1 unit.

Excentricity 02390933, that of the earth's orbit as to the theory of its motion. The elements of its orbit are as follows:

Epoch 1837, October, 14th, mean astronomical time at Berlin.

Semi-major axis 2:77263, that of the earth being assumed 1 unit.

Excentricity 02390933,
in order to arrange their notes and observations as well as his own. The journal which he had kept of his travels, and which he had sold all his time in arranging it, while the work was been regularly transmitted each year to St. Petersburg, and published on its arrival.

On his return to St. Petersburg, he received many marks of favour from the Empress Catharine, and became the devoted pupil of that great woman, and gained him several lucrative appointments. The office of instructing the grand-dukes Alexander (afterwards emperor) and Constantine in the natural and physical sciences was also entrusted to him. After remaining many years in St. Petersburg, quietly engaged in the pursuit of literature and science, in 1793 and 1794 he took advantage of the conquest of the Crimea to travel through the southern provinces of Russia. He was so much delighted with the climate and productions of the Crimea, that he resolved to remain in the country at least for two years. He had got a new appointment in St. Petersburg in 1795, but found that he had been given a great deal of variable, and sickly. The inhabitants are also barbarous, and he was deprived of all society. His existence was thus rendered very uncomfortable. He lived here however fifteen years, and employed much of his time in natural history. At last he returned to St. Petersburg, and finally left Russia in 1799, after forty-two years of absence: he survived his return a short period only, dying on the 7th September, 1811, at the age of seventy.

Any analyses of the works of Pallas is impossible, for he is (as it were) the accumulation of facts, which he always related in the simplest manner, leaving the easy task of drawing deductions from them to others. All his writings, of which he left a prodigious number, though written in a dry and uninteresting style, are full of novelties and truths.

The 'Elechus Zoophytorum,' the Hague, 1766, 8vo.; 'Miscellanea Zoologica,' 4to. Both these works appeared the same year, and were interesting from containing a great deal of information on those little known subjects of the animal kingdom, and had been accompanied by the name of his author. Pallas showed that the presence or absence of a shell should not form the primary basis of their distribution, but that the analogues of their internal structure ought to be consulted. The 'Elechus Zoophytorum,' which is principally devoted to sea corals, &c., is remarkable for the clearness of the descriptions and the care bestowed on the synonyms. The 'Miscellanea' was partly reprinted, with many additions (but with the omission of some of the most valuable parts related to the natural history of South America), in the first four numbers of which were published at Berlin, in 1767.

'Ravels through different Provinces of the Russian Empire,' published in German, St. Petersb., 1771-76, 3 vols. 4to. This work contains a great deal of valuable information, but is imperfect, from having been hastily compiled, without access to books of reference, during the author's travels. After Pallas returned to St. Petersburg from his first expedition, he published several interesting papers descriptive of the new and rare objects which he had met with in Siberia. His account of the musk, the glutton, the gibbon, and the polar bear may be particularly mentioned, which form the last part of the 'Miscellanea Zoologica,' and have since been translated. He published a separate volume on the different species of the 'Scipielegna Zoologica,' and they are still written. It is entitled 'Novi Species Quadrapedum ex Glierium Ordine,' Erlangen, 1778, 4to. The anatomy and history of these animals are excellently described in this work, which is also one of his best.

Pallas became a botanist during his travels, and undertook, by desire of the empress, a 'Flora Rossica,' illustrated with magnificent plates, two volumes of which were published at St. Petersburg, in fol. 1784-85; no more appeared.

The last great work which he wrote was a Fauna of the Russian empire, which he intended to embrace all the ani-

male found both in European and Asiatic Russia. He worked at it till his death, and completed the manuscript in 1803, when it was printed at St. Petersburg, in 1811, under the title of 'Zoographia Rosso-Asiatica;' but it was never published till 1831, in consequence of the plates having been lost. Some naturalists however managed to obtain copies of the text.

Pallas made an important discovery in geology in a memoir containing 'Observations on the Formation of Mountains,' which was read to the Academy of St. Petersburg, in 1777, before Gustavus III. of Sweden. An attentive consideration of the great mountainous chains of Siberia, Pallas to the ravages of the Medusa and Nereids, which has since been completely verified, of the succession of the three primitive orders of rocks, the granitic in the centre, the schistous on their sides, and the calcareous externally.

Pallas rendered further service to geology by his second work 'Novi Commentarii Acad. Petru.' He here related (what was at that time considered as an incredible circumstance) the fact of having found the body of a rhinoceros entire, with the skin and flesh on, imbedded in the frozen ground. The probability and truth of this observation are placed beyond all doubt by the well-known subsequent discovery of the body of an elephant in a mass of ice on the coast of Siberia. [ELEPHANT, FOSSIL SPECIES.]

Pallas wrote a History of the Mongolian Nations, 1 vols. in 12mo., at Berlin, 1777-1808, which is perhaps the most classical account that was ever written of any race of people. He not only treats of the origin and physical character of these people (all usually denominated Tartar), of their manners and government, but also of their religion and language. Pallas undertook, by command of the empress, a 'Comparative Vocabulary' of all the languages of the world, two volumes of which were published at St. Petersburg in 1787-1799, in 4to. They contain two hundred and eighty-six words in two hundred and fifty-four languages. A third volume, which never appeared, was intended to embrace the languages of Africa and America. The plan of this work (suggested by the empress) was bad, for a simple vocabulary can never give any idea of the mechanism and spirit of a language; it is however of considerable value.

Besides the works already mentioned, Pallas published, among many others, 'Travels through the Southern Provinces of the Russian Empire, in the years 1793 and 1794.' Leipzig, 1801, 2 vols. 4to., in German. There is an English translation of this work, which is also better than the different kinds of sheep found in the Russian dominions and among the Tartar hordes of Russia. The latter was translated by James Anderson, the agriculturalist.

Pallas was a member of the Royal Society of London, of the Institute of France, and of several other academies, besides that of St. Petersburg; and he wrote many memoirs, which will be found in their different Transactions.

(ELOGE HISTORIQUE, par Cuvier; Biographical Essay on Pallas, read at the Academy of Berlin, by M. Rudolph, 30th January, 1812.)

PALLAVICINO, SFORZA, son of the marquis Alexandre Pallavicino of Parma, was born at Rome in 1468, studied in the Roman College, and afterwards entered the order of the Jesuits. He wrote a philosophical treatise, 'Del Bene' (on happiness), and 'Stilo' (on style in written composition), both of which are esteemed. But the work for which he is best known is the 'History of the Council of Trent' (Istoria del Concilio de Trento, 3 vols. in 8vo., Rome, 1664), written in defence of the authority of Rome against the charges made against it by the celebrated Father Sarpi in his history of the same council. Both works ought to be consulted and compared, in order to form a just opinion of the important questions which they refer. Pope Alexander VII made Pallavicino a cardinal, and appointed him to the important affairs. His last work was on Christian perfection, 'Ars della Perfezione Cristiana.' Cardinal Pallavicino died in 1687.

PALLAVICINO, FERRANTE, born at Parma in 1615, entered at an early age the order of the Carmine of St. Augustine, and made his vows, but after a few years he found that he had acted rashly, and that he was totally unprepared for the life which he had embraced. Having obtained by superior's permission to travel, he repaired to Venice, where
he led a life of licentiousness, and wrote obscene books, which found a ready sale. He afterwards went to Germany as chaplain to a nobleman, and returned to Venice just at the time when he was involved between Edoardo Farnese, duke of Parma, and Pope Urban VIII., on the subject of the duchy of Castro. [FARNESI.] Pallavicino wrote in favour of his sovereign the duke, using violent expressions against the pope and his nephews the Barberini. One of his pamphlets was entitled 'Dividere Colose,' by which he intimated that a divorce had taken place between the church and its Divine founder. Pallavicino now thinking he was no longer safe in Italy, resolved to go to France, but unfortunately for him he was accompanied by a young Frenchman who had been engaged in England after many other names were dropped, and was one of those which Henry VIII., in 1536, declared not to be commemorated or cast away. (Procm. 26 Feb., 30 Hen. VIII.) They were borne till 2 Edw. VI. (Stowe's Chron., an. 1548.) These tracts or branches of palm, whatever they might be, underwent a regular blessing. (See the Missale ad Unam Ecclesiam Sarabitartem, 4to, London, 1555.) Fuller's 'Church History,' p. 222, says, 'Bearing of palms on Palm-Sunday is in memory of the receiving of Christ into Hierusalem a little before his death, and that we may have the same desire to receive him into our hearts.'

The Russians of the Greek church have a very solemn procession on Palm-Sunday.

PALM TREE. [PALS.]

PALMA, GIACOPO, called the Old, to distinguish him from his son of the same name, was born at Serinalta, in the territory of Bergamo (though Vasari says at Venice), and is said to have been a disciple of Titian. The dates both of his birth and death are not precisely fixed. Vasari says he died at the age of 48. He had always been considered to be a man of very good lotto, who was born in 1513, till La Combe, on the faith of an apocryphal anecdote of his having finished a picture left imperfect by Titian, who died in 1576, and by other dates, fixes his birth in 1540 and his death in 1608, at the age of 48, as stated by Vasari. But it must not be forgotten that Vasari, in his work published in 1568, says that Palma died at Venice, several years before. Palma's manner has much resemblance to that of Titian, whom he is said to have imitated in the softness, as he did Giorgione in the brightness of his colouring, the warm golden tone of which is extremely pleasing. It is generally said, that he had a peculiar manner of laying on his colours, by which he gave the appearance of high finishing without labour.

The paintings of Palma are highly esteemed (though some writers deny him originality) for the noble taste of his composition, for natural and pleasing expression, and the harmony of his colours.

Vasari speaks with high commendation of a picture by Palma, representing the ship in which the body of St. Mark was brought from Alexandria to Venice, exposed to the fury of a frightful storm. Other palaces there are, a Santa Barbara at Venice, and a St. Jerome in the Zanpier church at Bologna. The gallery of Vienna, Munich, and Berlin possess several of his works, and there are some in England; among them are a few which are ascribed to Giorgione, but in the opinion of Dr. Waagen, they are by Old Palma. (Fuseli.)

PALMA GIACOPO, called the Young, was born at Venice in 1544, a date which is alone sufficient to show the error of La Combe in placing the birth of Old Palma in 1540, as he would have been but 14 years of age at his great-nephew. Young Palma soon left the style of Antonio his father, an indifferent master, to study the works of Titian, and more especially those of Tintoretto. At the age of fifteen he was taken under the care of the Duke of Urbino, and maintained for eight years at Rome, where, by copying the antique, Michael Angelo, Raphael, and Polidoro, he acquired correctness, style, and effect, which he endeavoured to embody in the first works which he produced after he returned to Venice. Vasari believe that those works combine the best principles of the Roman and Venetian schools. They are executed with a degree of facility, which was the great talent of this master. He did not however succeed in obtaining adequate employment; honourable and important work was not confided to Tintoretto and Paul Veronese; and he owed the advantage of being considered the third in rank to the patronage of Vittoria, a fashionable architect and sculptor, through whose recommendation he was overwhelmed with commissions, which had the unhappy effect of relaxing his diligence. On the
In general they adhere to the soil by clusters of strong simple roots which not uncommonly form a hillock elevated above the surface of the ground. Their trunks are w.:d.:

The leaves, called fronds by Linnaeus, are alternate, with a very hard epidermis, and a distinct petiolo, from the base of which a coarse network, called the reticulum, sometimes separates next the trunk; they are usually either pinnated or fan-shaped, but are occasionally nearly split; two veins are parallel, the spaces between them plaited, and the whole size sometimes very great, as in the fan-palm. In which specimens have been seen as much as 16 or 20 ft. in breadth. (Corypha.)

The flowers appear in panicles spikes from the inside of the hard dry spathes, which are often boat-shaped, and although small, they are sometimes so extremely numerous that each panicle will weigh many pounds. They are generally hermaphrodite, but often numerous, dioecious, or polygamous. The female flowers are only slightly developed, and the pistil consists of two sessile, or minute, ovules. The stamens are either distinct or more or less united. The ovary varies in number, from 3 to a large multiple of that number, and bears 1-3-celled linear anthers which open along their inner face. The ovary consists of 3 carpels, which are sometimes deeply divided into three distinct carpels, or only partly abortive, so that the ovary is only one-celled. The ovaries are almost always solitary, and erect in each cell, but sometimes two are present, which in that case stand side by side; they are orthotropous in some genera and anatropous in others. The styles are very short, the stigmas simple.

The fruit varies extremely in its consistence and appearance. Sometimes it is 3-celled, often one-celled; in such species as the Cocoa-nut it is a kind of drupe covered by a soft sweet edible pericarp, as in the date; in others its surface is broken up into lozenge-shaped spaces, as in the Sugus, whose fruit looks as if covered with scale-armour. The seed is single, either solid or hollow, and consists principally of albumen of a white, yellow, or cartilaginous nature. When dry it is lodged a very small cylindrical embryo at some part of the surface distant from the hilum.

That palms were among the first plants which were created, is proved by the numerous remains of their frut : those of the forest are found in the most remote parts, and some of them are occasionally met with through all the most recent fresh-water rocks. They appear to prefer a soil in some measure salt, although many species are inhabitants altogether of inland districts and even of high mountains. Their geographical limits appear to be within 36° N. lat. in America, 45° N. lat. in Europe, 34° N. lat. in Asia, and 36° S. lat. in the southern hemisphere; and, according to Von Martens, their powers of migration are extremely small; none of them have been able to cross the ocean without the aid of the wind. The most fertile stations are near rivers and watercourses, and the sea-shore, some species scattered singly and others collected together into large forests.

There is scarcely a species of this order in which some useful property is not found. The cocoa-nut, the date, and others are valued for their fruit; the fan-palm and many more, for their foliage, whose hardness and durability render it an excellent material for thatching; the sweet juice of the palmyra (Borassus) when fermented yields wine; the centre of the date palm is nutritious food; the trunk of the Iriartea or Ceratoxyx exudes a valuable vegetable wax; oil is expressed in abundance from the oil-palm; an astringent matter resembling dragon's blood is produced by Calamus Draceus; many of the species containwithin their leaves and in other parts of them numerous small hard seeds or so tough that it is manufactured into cordage; and finally, their trunks are in some cases valued for their strength and used as timber, or for their elasticity, or for their flexibilis, as in the canes.
The number of species is estimated at about 1000, divided into 59 genera, distributed through 5 tribes. (Martius, *Familia ejusque Genera denou illustrata*; also the *Genera and Species Palmorum* of the same author; Endlicher's *Genera Plantarum*, p. 244; and Lindley's *Natural System of Botany*, ed. 2, p. 343.)

of all the forces in the East. Odenatus obtained several victories over the Persians, but being at last treacherously killed, his wife Zenobia, an aspiring woman, assumed the crown, and styling herself Queen of the East, asserted her sovereignty over Mesopotamia and Syria.

The confusion into which the empire was thrown by domestic dissension and the numerous aspirants to the throne left Zenobia undisturbed for several years, during the latter part of the reign of Gallienus and the subsequent reign of Claudius. But after Aurelian reigned as pretender and emperor, he resolved to put down Zenobia, who had extended her conquests over part of Asia Minor. Aurelian soon recovered that province, and defeated Zenobia's troops near Antioch, and afterwards at Emesa, in a great battle in which the queen commanded in person. He then marched to Palmyra, which appears to have been strongly fortified, as it required a long siege and a number of military engines to reduce it. Zenobia endeavored to escape towards the Euphrates, but was overtaken by the soldiers of Aurelian and made prisoner. Palmyra then burned upon the Palmyrenian left a garrison in it. He put to death several of the chief officers of Zenobia, and among others her minister, the philosopher Longinus. After some time, the people of Palmyra revolted, and killed the Roman garrison. Aurelian, on receiving information of it im went, marched quickly back to Syria, and having entered Palmyra without resistance, directed an indiscriminate slaughter of the inhabitants. This is avouched by his own letter to Probus, whom he appointed governor of the place, and which has been preserved by Vopiscus. Zenobia retired to Palmyra in the triumphal procession of Aurelian at Rome, after which she was allowed to reside at a country-house near Tibur, where she spent the remainder of her life. Syncellus says that she married a Roman senator, and had children by him. A Latin inscription at Palmyra, copied by Major Renauld and Dawkins, shows that the place was garrisoned by the Romans under Dioecletian, who built or restored several edifices. Justinian is mentioned by Procopius as having fortified Palmyra and placed a garrison in it. The Muslims took it under the caliphate of Abu Bekr, Mohammed's successor. (Ockley, *History of the Saracens*.) We hear no more of Palmyra after this till the twelfth century, when Benjamin of Tudela visited it. He says it was encompassed by a wall nine feet thick, and that there was a fort, 4000 Jews being the garrison. A French writer, Desaix, the valiant and prepared for battle, that make war with the children of Edom and the children of Garah or the Arvabians (the Agarabians of the Christian historians of the middle ages), subject unto the kingdom of Nordsalibus, and they help the king Ismael, King of the Syrian desert. Zenobia and her household were conducted to Palmyra by Grecius and Nathan and Uziel, have the pre-eminence. (Purchas, ix., ch. 5.) The latest historical notice of Palmyra is its plunder in 1400 by the army of Tamerlane. It has been in a ruined and desolate state for centuries past, and the spot is now almost impassable, being inhabited by a small tribe of Bedouin Arabs, who have built their hovels in the peristyle of the great temple.

The first appearance of Palmyra is very striking. Its innumerable columns and other ruins, extending nearly a mile and a half in length and width, by modern buildings, contrast by their snow-white appearance with the yellowish sand of the desert. But, examined separately, few of these remains can be called beautiful as works of art. The largest columns do not exceed 4 feet in diameter at the base, 30 feet in height, and there is a great diversity of architecture, all the columns being Corinthian, with the exception of those which surround the temple of the Sun, which are Ionian and fluted. (Irvy and Mangels, *Travels in Syria*, 1817.) Upon the whole, the columns are inferior in grandeur and style to those of Baalbek. The most interesting remains of Palmyra are perhaps its sepulchres, which are outside of the walls of the ancient city, and are built in the shape of square towers, from three to five stories high, each forming a separate cell, or five apartments for the reception of the dead bodies. Some of the chambers are ornamented with sculptures and fluted Corinthian pilasters, and the walls are stuccoed white. The ceilings, on which the pillars are still perforated, are painted like that of the pediment of the temple of the Sun at Baalbek, with the heads of various deities disposed in diamond-shaped divisions. Remains of mummies and mummy-cloths are found resembling those of Egypt. The lines of the streets and the foundations of the houses are distinguishable in some places.
rows of columns denote the areas of the open courts of private houses, at as Pompeii. The inscriptions found at Palmyra are either Greek or Palmyrene, with the exception of one in Hebrew and one or two in Latin. On the inscriptions of Palmyra see the work "De Inscriptiones Graecae et Palmyrenae cum Annotationibus Edw. Bernardi et Thomas Smithii," Utrecht, 1698, and that of the orientalist Father Giorgi, "De Inscriptionibus Palmyrenis qua in Museo Capitolino adseruntur interpretandis Epistola," Rome, 1762. On the inscriptions of Palmyra and the Palmyrene alphabet, which Barbelin had attempted to do before him, but not successfully. The antient commerce of Palmyra has been discussed by Heeren. (Journal of Education, vol. ii., and the references there given.)

Wood and Dawkins visited Palmyra about the middle of the last century, and published a description of its remains, with plates, folio, London, 1758. Since that time Volney, Cassa, Bankes, Irby, and other travellers have visited the spot.

PALMYRA (Zoology). Savigny's name for a genus of Dorsibranchiate Annelida, distinguishable by their upper fascicle, the bristle-like or hair-like processes forming which are large, flattened, disposed in a fan-shape, and brilliant as polished gold. Their cirri and branchiae are but little marked. Their body is elongated, and they have two rather long and three very small tentacles.

The only species known is Palmyra aurifera. Sav. Locality—Seas of the Isle of France.

PAL, applied by the Europeans in India to the stately palm called by botanists Borassus falcifolius. (Borassus.) This by the Hindus is called Tal and Tar, whence its name is said to be derived, and this being fermented to produce a spirit, has given origin to the toddy of Europe. It is the common palm of the Archipelago and the southern parts of India, and extends even as far north as 30° of N. latitude. Its leaves are employed in making fans and umbrellas, and in thatching: the fruit is eaten: the sap is drunk in its natural state, and for the purpose of making sugar or treacle to make it sweet or coarse sugar; but if fermented, it forms one of the intoxicating liquors of tropical countries. This tree often presents a very remarkable appearance, that of growing apparently out of the centre of the banyan tree (Ficus indica). This has been well explained by Dr. Roxburgh: it is a fact, that the latter, having been eaten by birds, is by them frequently deposited on the moist upper parts of the leaves and spathes of the Palmyra tree, where germinating, it soon sends down its descending shoots or roots, which, in course of time, entwine the trunk of the banyan-tree, and with only its bunch of leaves projecting beyond the trunk of the banyan-tree, out of which it appears to be growing, though actually older, and, like it, having its roots fixed in the ground.

PALO DE VACA. [COW-TREE.]

PALOMINO Y VELASCO, DON ACISLO ANTONIO, an eminent Spanish painter, was born in 1653 (some say 1658), at Bujalance, near Cordova, in the university of which he took a degree, but his predilection for the arts induced him to take instruction in painting from Don Juan de Valdes Leal, in whose company he went in 1678 to Madrid to make himself acquainted with the styles of different schools. He was introduced to king Charles II. by the celebrated Coke and obtained through the friendship of Carenno a commission to paint the gallery Del Ciervo. He painted the history of Psycho so entirely to the king's satisfaction that he gave him the title of his principal painter and a considerable pension. He obtained such numerous commissions, that not only did his extraordinary industry, he was often unable to do more than furnish the design, leaving it to be finished by his pupil Dionisio Vidal. His reputation continued to increase, and all his works which were executed at Valencia, Salamanca, Granada, Cordova, and Cordoba, to which he was frequently invited, were highly approved. They had been a reproach to him that among some of his greatest works, such as the Confession of St. Peter, in the cathedral of Valencia, and those of Cordova, the figures are too faithful transcripts of ordinary life. What he executed in oil or in fresco, is distinguished by invention and drawing, and his perspective and colouring are admirable. He died at Madrid, April 13, 1726.

The style of a work in three parts, theoretic, practical, and biographical. The first two bear the title of 'El Museo pictorico y Escala ottica.' The third part, 'El Parnaso Español pictorico, tomo tercero,' Madrid, 1724, though perhaps only intended as an appendix to the two others, is far by the most important and interesting. He may be considered, says Agustín, as the author of the last work, as copious, as credible, as negligent of dates, too garbulous for success, too indefinite for the delineation of character, but eminently useful with the emendations of modern and more accurate biographers.

PALOS, a little port of Andalucia, on the south-western coast of Spain, has become celebrated as the spot where Columbus sailed on his first voyage of discovery on the morning of the 3rd of August, 1492. (Columbus.) Palafox, a village in the province of Salamanca, to which some discomfiture of its inhabitants, to maintain two convuls for a twelvemonth for the public service, it was to this circumstance that it owed, what afterwards proved the honour, of furnishing the vessels employed in the discovery of the New World. The town, which at all times was very small, now contains 1100 inhabitants, whose only trade consists of wine, brandy distilleries for the consumption of Seville, and wood from the pine-forests in the neighborhood. The only remarkable building is a convent, formerly a monastery, and belonging to the middle ages, was occupied by the knights of the Temple. (Munio, Diccionario Geografico de España y Portugal, vol. vi.; Navarrete, Coleccion de Viajes, vol. ii.; Musa, Historia de la Tierra de Mexico.)

PALSY. [PARALYSIS.]

PALUDINA. (Malacology). (Pestismiones.)

PALYTHOIA, a genus of zoophytic animals allied to Acyonarium. (Zoantharia.)

Palus, a town on an arrangement in the department of Ariege or Arrigne in France. It is situated in the valley of the Arrire, and on the right bank of that river, about 10 miles north of Fox, the capital of the department, and about 40 miles south by east of Toulouse. Palmers was proclaimed president of France on the 4th of December, 1856; and on the 18th of January, 1857, he was invested with the title of Duke of Redola, and it ranked as the capital of the county of Fox. The town is of middling size; and though the streets are well laid out, the houses are ill built. There is a cathedral said to have been built from the designs of the architect of Louis le Grand; and if you start at Palmers, you will get 1510 for the town, or 6048 for the whole commune; in 1836, it was 6905 for the commune. The chief manufactures are of steel, files, scythes, ordinary woolen cloth, and cotton and woollen yarn; the wool employed in Spassilk. There are eight yearly fairs. Considerable trade in corn is carried on. The environs of the town are rich in currants, fruit, and pasturage. Palmers is the seat of a bishop; the bishop is a suffragan of the archbishop of Toulouse; his diocese comprehends the department. There are in the town two primary and three secondary schools. There is a chalybeate spring in the neighborhood, which is considered to be serviceable for chronic disorders.

The arrangement of Palmers comprehends the northern part of the department, and is divided into six cantons or districts, each under a justice of the peace; it comprises 115 communes, and had, in 1831, a population of 73,722.

PAMPAS. [Plaines.]

PAMPULON, or PAMPOLENA. (Navyera.)

PAMPILHUS was a native of Symbol, and the founder of the Symbolian school of painting. He introduced a new style of painting, and for the first time in Spain, to which he was succeeded, was acknowledged by the connoisseurs. His pupil Pampilhus, Eupompus established those principles of art which Euphrax, Apelles, Protogenes, and Arnaces successfully developed. The characteristics of the Symbolian school were, a stricter attention to the strict truth of nature, and a more systematic style of design. The leading principles of Eupompus were, that man should be represented as he actually appears, not as he really is, and that nature henceforward was to be imitated, not an artist. (Pliny, xxxiv, 15.) Such was the answer which Eupompus gave to Lyceus.
being asked by him which of his predecessors he should imitate.

Pamphilus succeeded Europamus in the school of Sicyon, and taught his principles to Apelles. He was, says Pliny (XXX. 10, 36), the first painter who was skilled in all the sciences, "one of the "demiurges" of our age before the "philosophers," a man of unusual talent and geometry, without which he denied that art could be perfected. By arithmetic and geometry we must understand those principles of the art which can be reduced to rules; by arithmetic, the system of the construction and the proportion of the "figures" of the human figure; by geometry, the perspective and optics, at least so much of them as is necessary to give a correct representation of and a proper balance to the figure. Flaxman properly explains the terms by the rules of proportion and motion; he remarks, "How geometry and arithmetic are applied to the study of the human figure." Vitruvius informs us from the writings of Greek artists, perhaps from those of Pamphilus himself: "A man," says he, "may be so placed with his arms and legs extended, that his nose shall touch the extremity of his fingers; and toes. In the like manner a man standing upright, with his arms extended, is enclosed in a square the extreme extent of his arms being equal to his height." Flaxman remarks also, that "the ancients attribut" so much attention to the distance of the limbs, and to the centre of gravity.

Such was the authority of Pamphilus, says Pliny (XXX. 10, 36), that it was a matter of course, in Sicyon and throughout all Greece, noble youth were taught the art of painting from the very cradle; by a long, continuous, and solemn instruction, with care and attention, they were educated, and instructed in all the sciences, both in their theoretical and practical parts.

In this school of Pamphilus, the most famous of all the schools in the world, and in which the highest order of artists of all ages have been instructed, the time occupied by the study of the human figure, anatomy, and painting in its different branches. The fee for admission was 216. sterling; Pliny mentions that Apelles and Melanthius both paid this fee. Apelles studied under Epheus, and, before he entered the school of Pamphilus, he was instructed in the elements of painting under Pamphilus, but Pliny does not inform us whether he belonged to his school and paid the above-mentioned fee.

Pamphilus, like his master Europamus, seems to have been occupied principally with the theory of art and with teaching the principles to his pupils, while Apelles, his pupil, and his pupil Melanthius, according to Quintilian (xii. 10), were the most renowned amongst the Greeks for composition. We have accounts of only four of his paintings, the "Horae," mentioned by Aristophanes (Phileus, 385), and three others mentioned by Pliny the Elder in his work on "The History of the Athenians, Ulysses on the Raft, and a relationship, 'cognatio,' probably a family portrait; these pictures were all conspicuous for the scientific arrangement of their parts, and their subjects certainly afford good material for the "cognatio."

The period of Pamphilus is sufficiently fixed by the circumstance of his having taught Apelles, and he consequently flourished somewhat before and about the time of Philip II of Macedon, from 359 to 348. He belonged to the court of the Philoi, and his pupil Apelles, who was generally held to have been the father of Pheidias, was also connected with the court of Philip II, and it is probable that Pamphilus had also a share in the common fate of the writings of every other antient artist. He wrote on painting and famous painters.

Pampillus was bishop of Caesarea in Palestine, and the intimate friend of Eusebius, who was called Pamphilus after him. He was succeeded by Berytos, and to have been educated by Piersus. He spent the greater part of his life in Caesarea, where he suffered martyrdom in the year 309.

He was a man of profound learning, and devoted himself chiefly to the study of the Scriptures and the works of Christian writers. Jerome states that he wrote out with his own hand the greater part of Origen's works. He founded a library at Caesarea, chiefly consisting of ecclesiastical works, which became celebrated throughout the Christian world. It was destroyed before the middle of the seventh century. He constantly lent and gave away copies of the Scriptures. Both Eusebius and Jerome speak in the highest terms of his piety and benevolence.

Jerome states that Pamphilus composed an apology for Origen before the death of this great doctor; but at a later period, having discovered that the work which he had taken for Pamphilus's was only the first book of Eusebius's apology for Origen, he denied that Pamphilus wrote anything except short letters to his friends. The truth appears to be that the first five books of the "Apologia" of Jerome are the same as those of Origen, and Pamphilus jointly, and the sixth book by Eusebius alone, after the death of Pamphilus. Another work which Pamphilus effectuated in conjunction with Eusebius was an edition of the Septuagint, from the text in Origen's "Hexapla." This edition was particularly used in the East, and by Montfaucon and Fabricius has been published "Contents of the Acts of the Apostles" as a work of Pamphilus; but this is in all probability the production of a later writer.

Eusebius writes according to Herodotus in three books, which is now entirely lost, with the exception of a few fragments, and even of these the genuineness is extremely doubtful. We have however notices of him in the "Sacred History of Eusebius" (vii. 32), and in the "De Viris Illustribus" of Jerome (xi., i., viii., c. 2).

PAMPHYLIA (Παμφυλία), a province of Asia Minor, formerly called Mopsocia according to Pliny (Hist. Nat. v. 26), extended along the coast of the Mediterranean from Olybia to the "Polemas" (Philod. H. 660 st. 37); it was surrounded by the high mountains of Cilicia and Lydia. The eastern part of the coast is described by Captain Beaufort as flat, sandy, and dreary, but this remark does not apply to the interior of the country, which, according to Mr. Fellows's account (Excursion in Asia Minor, p. 294), is very beautiful and pleasant. The country is hilly, and the climate is mild, but the rains depress it. The rainy season is in the spring, and the summer is dry and hot. The coast is surrounded by lofty mountains, which rise from the sea and attain the greatest height in Mount Solyma on the eastern borders of Lydia. The western part of the country is composed, according to Mr. Fellows (p. 184), for thirty or forty miles, of a mass of inerudite or petrified vegetable matter, lying embossed, as it were, in the side of the high range of marble mountains which must originally have formed the coast of this country. As the streams, and in particular the large river called the "Pamphylia," which rises from the mountains, enter the country formed of this porous mass, it is likely that it will disappear beneath it; a few little streams only are kept on the surface by artificial means, for the purpose of supplying aqueducts and mills, and being carried along the plain, fall into the little valleys of the rivers. The coast of the "Pamphylia" is washed by the sea, and the mountains rise abundantly all along the coast, sometimes at the distance of a quarter of a mile from the shore.

The Pamphilus of the "Sacred History of Eusebius" (vii. 91), were descendants of the people who followed the fortunes of Philotheus and Calchas after the destruction of Troy. They were subdued by Croesus (Herod. i. 28), and afterwards formed part of the Persian empire, and supplied Xerxes with thirty ships for the invasion of Greece (Herod. vii. 91). We know very little of the history of this province, and it is not improbable, considering its proximity to Pisidia, that its dependence upon the Persian empire was at times merely nominal. Under the Syrian kings it formed a separate province included in the province of Galatia (Tac. Hist. ii. 9.)

Though Pamphilus was of small extent, it contained several cities, which were incorporated within the province of Galatia. The city on the east side of the "Pamphylia," and on the coast, and beyond it, on the eastern bank of the "Pamphilus," was Attalia (Adana), founded by Attalus Philadelphus, king of Pergamus. This city was visited by St. Paul in his second journey from Perge to

P. C., No. 1061.
Antioch (Acts xiv. 25, 43). Mr. Fellowes, who visited Adalia in 1838, speaks of it as a small but clean town, built on a cliff which rises sixty or eighty feet above the sea, and informs us (p. 187) that it contains numerous fragments of ancient buildings, columns, inscriptions, and statues, which are generally built into the walls of the town with care and some taste.

It is situated 56 stadia from the coast, on the Cestrus (Aetus), was Pergae, in the neighbourhood of which was a celebrated temple of the Pergamene Artemis, at which a sacred meeting (Ephhypoge) was held every year (Cic. in Verr. i. 20; Strabo, p. 667). Pergae was visited twice by St. Paul, each of which occasions, mentioned by the Apostle, xiii. 13), and the second time, on his road from Pisdia (Acts xiv. 24, 25). Pergae was situated between and upon the sides of two hills, with an extensive valley in front, and backed by the mountains of the Troas (Fellowes, p. 185).

It contains a large theatre, of which the rose-palap is a large theatre, of the width of 330 feet, a stadium, or course for races, and two or three temples. The next town which we come to is Aspendus, on the Berytoned, at the distance of 80 stadia from the sea (Strabo, p. 667); the greatest of which was built on a precipitous rock (Arrian, i. 36). It appears to have been a place of considerable importance in the time of Alexander, who punished the inhabitants severely for refusing to contribute fifty talents and a horse to the army, which they had been accustomed to rear for the king of Persia (Arrian, i. 26, 37). Under the Seleucids it was able to send 4000 men against Solge, a town of Pisidia (Polyb. v. 73, s. 3); and Cicero speaks of it in his time as an ancient and noble city, full of the great and the happy (Epist. ad Fam. 9. 23). It appears that Aspendus is doubtful. Most modern maps place the modern village of Sutrac upon what is usually supposed to be the position of Aspendus; but Mr. Fellows states that no remains of antiquity are to be heard of in the neighborhood, and that upon the site of Aspendus, where the river Este (Eskh), which was founded by the Aethian Greeks of Cilicia in Myasia; but the inhabitants, according to Arrian (i. 36), did not speak Greek. The ruins of Side, which contain a large theatre, have been described both by Earnest Beaufort and Mr. Fellowes, but they are far inferior to the ruins of most of the other cities of Pamphylia.

PAN, a deity of the Greek mythology, whose country was Arcadia. He was the tutelar god of the shepherds. Pan is represented with two horns, a goat's beard, a goat's tail, and goat's feet, holding the syrinx, a kind of musical pipe, which he was said to have invented. The satyrs are his attendants. Pan is mentioned in the early myths as having been the son of the god of the Titans, whom he assisted in routing the Titans by frightening them by blowing in a sea-shell. He was also said to have accompanied Bucephalus to India, and that upon one occasion, by uttering a loud scream, which was repeated by the wind in the mouth of the elephant. From these incidents the expression 'panic fear,' meaning to strike with terror, by no obvious or sufficient cause, appears to have been derived. Pan was worshipped at Athens and other Greek cities. His worship was introduced into Italy at an early period, where he was called Lupercus, and Lupercus, Lupercus, were instituted in honour of Pan Lupercus, the protector of the flocks against wolves. According to Servius (note to Virgil's 'Eclogues,' iii. 31) Pan was also considered as the god of Nature, a personification of the universe, the world, the earth, and the sea, and was called Mercury, Jupiter, Jupiter, Lycurgos, in general the god of the Athenians, and of Demos and Aristophanes, generals of the barbarians (Pliny, xxxviii. 9, 34); their respective names were not attached to the figures in this instance (Eusebius, 'Against Ctesiphon'), that having already become an antiquated custom. These gods have been considered to be the portraits in the fullest sense of the term, but the picture of Panamnon cannot have been painted much less than 40 years after the battle of Marathon took place, and nearly as many after the deaths of most of the above-named generals. At the Olympic Games held at Olympia 20 years after the battle of Marathon; on the Olympic Games was painted in the 86th, 35 years later, and Pliny mentions the 83rd as the period of Panamnon. The paintings therefore, unless taken from earlier pictures, like the daughter of the son of the son of the Greek, are confined to the costume and decorations of generals as known to have been worn by them upon the occasion; and the 'ionics' consequently, whether paintings or statues, represent the officers sometimes portraits in countenance as well as in figure, are there principally谄causal.

The painting of the Battle of Marathon was in four great divisions; the first represented the positions of the two armies before the battle, the second and third the principal incidents during the battle, and the fourth the total rout and flight of the Persians; each in itself an extensive composition and forming an independent picture. (Pausanias, i. 15.) It appears that Micon assisted Panamnon in painting these pictures, and was fined 30 minas (1068), for having painted Panamnon in the act of throwing a spear.

The paintings and decorations of the Olympic Games in Panamnon were on the throne and on the walls around the throne of the statue. (Strabo, viii. 354.) The subjects of the paintings were, Atlas supporting Heaven above, with the Earth and the winds at his feet; and the god of the sea, of whom he was separated from his burden; Theseus and Perithoösus; figures representing Greece and Salamis, the latter bearing the rudder of a ship in her hands; the Combat of Hercules with the Nemean Lion; Ajax and Cassandra; Hippodamia, daughter of Oeneus; Charon, with Polis mother; Pausanias chained, and Hercules preparing to destroy the vulture which preyed upon him; and Penelope; and engaged by Achilles, with the Nemean mina. (Pausanias, i. 14.)

Pliny tells us that Panamnon painted the interior of the temple of Minerva at Elia with milk and saffron; he painted also the inside of Minerva's shield, but in what manner we are not informed.

Already in the time of Panamnon, priestesses were established at Corinth and Delphi, in one of which he was defeated by Timagoras of Chalcis at the Pythian games. (Pliny, xxxviii. 9, 34. Although this is the only notice we have of Timagoras, he must have been a painter of considerable merit, from this single circumstance. He himself celebrated the virtue of this lascivious image, which was not evil. He was very temperate in his opinions, and he often replied to difficult questions with modest hesitation, saying 'i.e. consider.'
None of the works of Panetius have come down to us, but their titles and a few sentences from them are quoted by Cicero, Diogenes Laertius, and others. He wrote a treatise 'On Duties,' the substance of which Cicero merged in his own work 'De Officiis.' Cicero says that Panetius had died in a manner which made it hard to test the cases in which men deliberate between what is honest and what is dishonest; the second, concerning what is useful and what is disadvantageous; and the third, of those cases in which the useful is opposed to the honest; that he treated the two first in a masterly manner, but did not go on with the third part, although he had promised to do so, and though he lived for thirty years after he had composed the others.

His disciple Posidonius supplied in some degree the deficiency. (De Officiis, ii. 8, and Epist. ad Att., xvi. 11.)

Panatius wrote a treatise 'On Tranquillity of Mind,' which some suppose may have been made use of by Plutarch in his work bearing the same title. He wrote also a book 'On Practicability,' and another 'On Magistrates,' and one 'On Heroes,' or sects of philosophers. His book 'On Socrates,' quoted by Diogenes Laertius, and by Plutarch in his 'Life of Aristides,' made probably a part of the last-mentioned work. Laertius and Posidonius mention Panatius, and even his opinions, ethics and metaphysics, and also physics. He argued that the torrid zone was inhabited, contrary to the common opinion of his time. Seneca (Epist. 116) relates his prudent and dignified reply to a young man who had asked his advice how he should proceed further in his studies; concerning this distinguished philosopher of antiquity, see 'Disputatio Historic-Critica de Panatii Rhodii,' by F. G. van Lynden, Leyden, 1802; and Chardon de la Rocquette, 'Ouvrages de Critique et de Philologie,' vol. i., Paris, 1816.

Panama, The Isthmus of, constitutes the most eastern and the narrowest portion of the long isthmus by which the two Americas are united. It extends, together with also Panama, which is contiguous to it, the west, from 77° to 83° W., long, between 7° 26′ and 10° N. lat. When measured along its curve, the length from east to west is nearly 500 miles, but its width varies from 30 to 100 miles. It may cover a surface of about 30,000 square miles, or considerably more than the extent of Ireland.

The town of Santa Maria, the first European settlement in America, was founded by Balboa, in 1510, on this isthmus, but the site is now hardly known. Though the commerce and population have increased, this seems to be a place of little importance, and the great advantages which it offered to a speedy and easy communication between the Atlantic and the Pacific were apparent, yet for three hundred years after this discovery the natural features of this region were entirely unknown, and it is said that the isthmus is traversed in all its length by a range of high mountains; and it is only of late years that Mr. Lloyd, an Englishman, has surveyed the most eastern and narrowest part of the isthmus.

Soil, Climate, and Rivers.—The place where the Andes of South America terminate has not been quite ascertained. On our map a mountain is laid down, near 8° N. lat, which is called the Peak of Candelaria, but it is not known whether it is connected with the Andes or with the low isolated summit. There are some reasons for suspecting that it is not connected with that mountain-range. But it is certain that west of this mountain (77° 30′ W. long,) no range of hills or mountains, not even an isolated elevation of moderate height occurs. The isthmus is the result of two seas that form a flat country, only a few feet above high-water mark. This low country extends westward for more than a hundred miles to the western extremity of Mandingo Bay. The average width of this part of the Isthmus is 30 miles, and the Bay, called also the Gulf of St. Blas, it contrasts to less than thirty miles. The shores on both oceans are rocky, and the whole region appears to consist of an immense mass of rock. The rocks however are covered by a thick layer of vegetable mould, and are covered with high forest-trees. The shores of the Caribbean Sea are difficult of access for large vessels, being lined with numerous small rocky islands called keys. Two rivers drain the Isthmus. They are called respectfully Chucunaque and Chepo, and rise near 30° W. long. The Chucunaque is about twenty miles, and turns west by an abrupt bend falls into the Bay of S. Miguel; the Chepo or Ballano runs west-north-west, and empties itself into the Gulf of Panama, about 24 miles east of the town, making a similar turn to the south. Both rivers are navigable for large river barges as far as the places where the great bend occurs. With all the advantages which this region possesses from its great fertility and the vicinity of two great oceans and navigable rivers, it is thinly inhabited, and chiefly by the Indians, who are constantly inimitable by the whites settlers, though they receive in a friendly manner the vessels which annually visit the country from Jamaica. The whites have only a few settlements on the Chepo river, and even these are simply at the mouths of large river bays. For a distance of 30 or 40 miles above the mouth of the Chepo, the summit of the mountain, above the bend of the river of that name, is the most considerable settlement of the whites, but the inhabitants have little communication with their neighbours the Mandingos. The scantiness of the population of this region is mainly if not entirely due to the unhealthy climate of the climate. Being open on all sides to a vast expanse of ocean, every wind brings rain, and thus hardly a day passes in which the country is not drenched by heavy showers, which sometimes last for several days together.

The surface of the land is covered with having to carry off such an abundance of moisture, is converted into an immense swamp. This moisture of the air indeed maintains a most luxuriant vegetation, but the great quantity of vegetable matter is not reproduced and decomposed, increases the misasms which originate from a swampy soil under the influence of a vertical sun.

At the western extremity of Mandingo Bay some hills commence, which gradually attain the elevation of mountains, and extend in a confused chain, but the point where it is drawn across the Isthmus from Port Limones to the town of Panama, a distance of about 60 miles. These hills advance close to the shores of the Caribbean Sea, where they surround the town of Puerto Velo, but they remain a few miles distant from the Pacific, separated by a low level prairie destitute of trees. These hills occupy nearly the whole width of the Isthmus, but they are divided longitudinally into two ridges, between which lies the valley of the river Chagres. The southern ridges do not exceed 1000 or 1500 feet in altitude, the northern are more precipitous, especially east of Puerto Velo. These hills are generally covered with thick and almost impenetrable forest.

The valley of the river Chagres is rather narrow, but the river itself is navigable to a considerable extent. (Chagres.) The country is a mass of tamarisk and Mandingos or the red tree, the wood of which is much prized in Europe. September and October in the southern coast, the rains are almost continual, and generally descend in torrents, a circumstance which renders that place very unhealthy. At Panama, on the shores of the Pacific, the seasons are dry. In April the weather becomes dry about noon, but after driking for half an hour it clears up. In May, from nine to eleven o'clock, it is dull with slight rains, but the afternoon is fine. In June there is rain at any time of day, but the day is generally clear.
Bay of Limones begins the third region of the Isthmus, which extends westward on the Caribbean Sea to the rocky island called Escudo de Veragua, and on the Pacific to the innermost corner of the Gulf of Panama, a distance of about 80 miles. This country exhibit different natural features. It is, in the main, a plain which rises from both oceans with a very gentle ascent towards the middle of the Isthmus. Numerous isolated hills however, rising from 300 to 500 feet above their base, are dispersed over the surface of this plain. These hills occur much more frequently towards the east than towards the west of the region, and near the mountain of Puerto Velo and the table-land of Veragua; in the middle of the region are plains of considerable extent, especially between the towns of Chagres and Chorreras; on these plains some isolated ridges of hills of inconceivable height occur, of which the general surface is composed of plains and low grounds which surround them are savannahs or prairies, destitute of trees, but covered with grass, which supplies pasture to numerous herds of cattle and horses. Though the vegetation in the region is generally much more vigorous than in the country farther east, there are several cultivated tracts and others which may be cultivated. The climate also is much more healthy, especially on the slope towards the Pacific, which in climate and season exactly resembles the, soil and climate of the town of Panama. The country along the shores of the Caribbean Sea is far less healthy, and the season much more irregular. Accordingly we find that the southern districts are comparatively thickly settled, while the northern are nearly uninhabited. This also holds true of this region. The land is divided and the Caymito or Chorreras. The Trinidad enters the Chagres about 24 miles from its mouth, after a course of about 60 miles. It rises near the south coast, not far from the town of Chorreras, and is navigable in the greatest part of its course, including the town of Panama, in a diagonal line from south-west to north-east, the agricultural produce of the more inhabited districts is conveyed by this river to Chagres. The Caymito or Chorreras is formed by several petty streams which descend from the mountains, and it is joined by a number of streams which pass over the plains of Veraguas, though its course is short, it is navigable to the town of Chorreras. There is a harbour at its mouth, but the anchorage is bad and exposed.

Vessels of this region may be expected to be sent for in the confines of the Isthmus, where the table-land forms a part of the coast, and where there is an almost perpendicular face of bare rock. The surface of the table-land itself is very uneven, and several summits on it rise 3000 feet above the sea. The peak of Veraguas is still higher, and attains nearly 9000 feet above the sea-level. In some places however there are plains of considerable extent. The general elevation of this table-land above the sea-level is supposed to be between 3000 and 4000 feet. It approaches the Curicó, in the lower part of the country, a few miles from the coast, by a narrow and slightly hilly tract. But on the side of the Pacific the mountains approach close to the sea, and between the Gulf of Parita and the Bay of Montijo project in a wide and mountainous peninsula into the Pacific. This peninsula terminates in the headlands of Punta Mala and Punta Maritana. We are very little acquainted with the climate and soil of this region, but as it undoubtedly is much more populous than the lower part of the Isthmus, it must be presumed that it is favourable to agriculture and to the raising of the natural produce of the country. The last circumstance is due to the great elevation of the surface above the sea-level. The rivers which descend from this table-land are interrupted by rapids and cataracts, and bring down a great quantity of earthy matter, which they deposit at their mouths. All these rivers accordingly have a bar, with a very few feet of water on it, which renders them incapable of receiving vessels above 100 tons burthen.

The most western portion of the Isthmus of Panama begins at the mouth of the waters of the river of Veraguas, and extends to the boundary-line of Central America. This line begins on the shores of the Caribbean Sea at Chica or Monkey Point, and terminates on the Pacific at Punta Boruca. This region is rather more than 100 miles from east to west, and about 70 miles from north to south. The northern part is occupied by the Chiriqui Lagoon, a sheet of water 90 or 100 miles in length from east to west, and on an average twenty miles wide. It is separated from the Caribbean Sea by a series of low, swampy, and wooded islands, between which there are three deep passages for vessels. The most commodious of these passages is the most eastern, near a tongue of land projecting from the continent. It is called Chiriqui Mouth, and may be navigated by the largest vessels. Further west is the entrance called Boca del Toro (Bull's Mouth), which is only 10 feet deep, and about 70 miles from east to west. The entrance called Boca del Dragon (Dragon's Mouth), is also narrow, but very deep. The middle portion of the lagoon is occupied by low woody islands, but at each extremity a considerable space is free from islands, and afford excellent anchorage. The whole lagoon is about 20 miles wide, and the Caribbean Sea is broken by the intervening islands. The country contiguous to the southern shores of the lagoon, for a distance of about 20 miles, is low and swampy, the soil being covered with a thick layer of alluvium produced by the annual floods of the rivers. At the back of this low tract, which is generally wooded, the country rises, and though it contains plains of some extent, it continues to rise gradually for 40 or 50 miles from the lagoon, to the arch that protects the coast from the south. This arch is in the form of a high ground. This chain, which is called the Cabecerreers Mountains, may be between 4000 and 5000 feet above the sea-level, but it is of very considerable width, being only about 500 yards across in its upper part, which extends in a nearly straight line without any peaked summits. The southern slope of this ridge is much more rapid, occupying only about 10 miles in width, and terminating on the Pacific in tolerably level tracts, which however are many feet above the level of the sea. The whole country north of the Cabecerreers Mountains is covered with wood and brush, and the Cabecerreers Mountains have more regular weather, and is considered tolerably healthy. The numerous rivers which run from the northern slope of the mountains into the Chiriqui Lagoon are impeded by many rapids and cascades until they reach the low country, where their course is gentle, and where they may be navigated by large boats; but they have bars across their mouths, with little water on them.

Plantations.—This isthmus is very rich in vegetable productions. Lloyd has given a list of 96 trees, useful as timber, dye-woods, or for cabinet-work and domestic purposes. Some of them bear estab. fruits. It also produces all the fruits and esculent vegetables cultivated in other intertropical regions; such as the banana, the guava, the papaya, the pineapple, the orange, the sugar-cane, and the coffee plant. Coffee and cacao are cultivated for domestic consumption; a small quantity of the latter is exported. The caoutchouc tree, the oil mill tree (Palo de Vaca), sarsaparilla, and vanilla plant grow in the woods. The sweet orange is very abundant, and its gum sells very dear. Cattle, horses, and mules are reared in those districts where there are natural prairies or savannahs. The woods are inhabited by numerous wild animals: tiger-cats, which seldom exceed the size of a cat, and the jaguar, which is larger, and much heavier, or a species of wild boars, which are frequently met in droves, and attack men; deer; conejos, which are somewhat like our rabbits, but larger; boats of monkeys; wild turkeys, both black and coloured, and many other birds. The box abounds in the country, as do also fish, eels, whales, alligators, and turtle. It does not appear that the snakes and poisonous reptiles for which the Isthmus was formerly noted exist in great number. There are gold-mines in the mountains near Puerto Velo, but their produce is insignificant. It is said that the fertility of this province is ascribed to the fertility of the table-land of Veragua, and in the country of the Valientes. Copper and iron are abundant, and tin and mercury are stated to occur.

Political Divisions; Population; Trade.
and the country south of the Chiriqui Lagoon, to the boundary-line of Central America. The province of Panama is subdivided into six and that of Veraguas into four cantons.

The coast along the Caribbean Sea from the Bay of Can-delaia, into which the river Atrato falls, to the Bay of Mandingo, does not present a single harbour for large vessels. It is lined by a continuous series of small keys, or rocky islands, running across the entrance from the sea. This passage thus formed is full of coral reefs and rocks, but the water is so clear that they are easily seen and avoided in the day-time. Otherwise a vessel finds safe anchorage there, except during the prevalence of the northwesterly gales (June, July, August, and September), when the sea is broken by the islands. The first harbour which occurs on this coast is that of Puerto Bello, or Velo, which is about two miles long, and on an average 1000 yards wide. It is of considerable depth, and, being surrounded by high hills along both sides, is protected from the ocean in case the sea is broken by the islands. Though it once was a place of great trade, it is now rarely visited, on account of its excessive unhealthiness. The town, which is built on the southern shores of the harbour, consists of one long street with a few short streets branching off where the ground will admit of them. It is surrounded by mountains covered with dense forests: it contained, in 1827, not more than 1122 inhabitants, negroes and mulattos. About 20 miles farther west is the Bay of Li-mona, Ca. Punta Larga, which is a cape or a promontory, wide, free from danger. It is several miles deep, and several projecting points on its western side afford secure and commodious anchorage within them, especially the innermost, which is at present considered as the harbour. The climate is comparatively healthy, but it is not visited, the surrounding country being uninhabited. A few miles farther west is the harbour of Chagres, a little sandy bay, which is only open to westerly winds, and is formed by the mouth of the river of the same name. A ledge of rocks runs out into the sea part of the way in the form of a gulf. They are in the deepest part, and in many rising very even to the surface. Under the most favourable circumstances no vessel drawing more than twelve feet can enter the harbour. Further westward there is no harbour, except those afforded by the creeks. The harbours on the shores of the Pacific are all within the Gulf of Panama. There appears to be no port west of Punta Mala. The opening of the Gulf of Panama is between Punta Francisco Salano on the continent of South America and the Island of Isla de las Perlas, which breadth it preserves for about 10 miles northward, when it begins to contract. In the northern and narrower portion of the bay there is a group of islands, called Archipelago de las Perlas, on account of the pearls which were formerly found in the sea, though they are not now. These islands are still taken to be considerable. The largest of these islands, called Isla del Rey, rises to a considerable elevation. Most of the rivers which fall into this bay admit vessels of considerable burden. They have indeed bars across the same, and in some places, as near the mouth, two feet of water at low tides, but as the tides in this bay rise 18 feet, the bars may be passed at high-water, and in side of them the harbours are deep. The rivers which are sometimes visited by vessels are the river Pacora, about 18 miles east of the town of Panama, and the Rio Grande, which runs into the sea about two miles west of that town.

Panama is the principal trading-place on this bay. It stands on a tongue of land shaped nearly like a spear head, forming a convenient distance on the land to the sea, and gradually swelling towards the middle. The principal streets extend across the peninsula from sea to sea. The houses are of stone, generally two or three stories high, substantially built, and the larger houses have courts or patios. This is a city which brings much trade, especially a nunnery of Santa Clara, and a college. As the sloping shores contiguous to the ground on which the town stands are dry at low-water to a considerable distance, the anchorage is about 6 or 7 miles distant, where it is protected by a number of islands, the largest of which is called Perico, a name which is also applied to the harbour. These islands are high and well cultivated, and supplies of ordinary kind, including excellent water, may be obtained from most of them. In 1827 the town had nearly 11,000 inhabitants. It carried on a considerable trade with several of the ports of South America, especially with Guayaquil.

In the interior of the Isthmus, west of Panama, there are several considerable towns. The town of Chorrera, on the banks of the Ceymoro or Chorrera, has 4000 inhabitants. Darién has a population of 4568, and Los Santos 4569. These two places are near the shores of the Bay of Panama, but have no harbours. In the province of Veraguas, the capital, Santiago de Veraguas, had, in 1822, 4568 inhabitants; the town of La Mesa, 4451; and Santiago de Culebra, 2611.

Inhabitants and Population.—A great portion of the Isthmus, perhaps one-third, is still in the exclusive possession of the aborigines. These tribes occupy both extremities of the Isthmus. Nearly the whole of the Isthmus east of the Bay of Panama is inhabited by the dark-skinned Indians, who comprehend under the collective appellation of Mandingo or San Blas Indians. Roberts thinks that they are a race of people quite distinct from the other natives on the southern and western shores of the Caribbean Sea. He describes them as much shorter in stature, few of them exceeding five feet two or three inches in height, with a full chest and broad shoulders, and foreheads low and rather flat. Their eyes are small, and generally a black or dark brown colour, their cheek-bones broad and full, and their lips not very thick. Among them he found some Albinos, who had been observed by earlier travellers. They are an active hardy race of people, very jealous of their independence, and hostile to the whites who have settled among them. The women are clothed in wrappers of blue bajas or striped cloth, drawn from the breast to a little below the calf of the leg. They cultivate plantains, bananas, maize, and manioc, though the adjacent sea and the rivers abound in fish and shell-fish, and the forests in edible animals. They also rear many fires.

The western portion of the Isthmus, which surrounds the Chiriqui Lagoon, is inhabited by the Valientes, a collective name given by the Spaniards to different tribes inhabiting it. They are of dark complexion, are much taller than the Mandingo Indians, and seem to have made greater progress in civilization. Their dress formerly consisted of a covering made of a sort of tree-bark, six or seven feet long, and about five feet wide, with a hole cut in the centre to admit the head; but they now wear the European dress, and many of them put on a complete European suit. Their extensive plantain-groves, maize-fields, and manioc plantations exhibit a great deal of industry and care; and among other things they plant the cacao-tree, the produce of which is extensively exported. The population of those parts of the Isthmus in which European settlements have been made consists chiefly of mulattos and negroes, the number of whites being comparatively small, except Panamá and in the larger towns. This however applies chiefly to the province of Panama.

According to a census taken in 1822, the department of Isthmo contained a population of 101,550 individuals, viz.:—

- Canton of Darién: 1,172
- Canton of Santiago: 14,170
- Puerto Velo: 2,425
- Remedios: 5,010
- Panamá: 16,724
- La Mesa: 8,728
- Chorrera: 7,411
- Alange: 7,465
- Natá: 17,108
- Los Santos: 21,348

66,188

Commerce.—The countries inhabited by the Mandingo and Valientes Indians are annually visited by several vessels from Jamaica, which export considerable quantities of tortoise-shell, sarsaparilla, and salt, and some calves' hides, which they import manufactured cotton goods, cutlass-blades, and a variety of toys and small articles. The port of Chagres is annually visited by from thirty to forty European vessels, mostly from Guayaquil, Lambayeque, and the ports of South America bordering on the Pacific, to which parts the greater part of the cargoes are shipped at Panamá. The harbour of Panamá is usually visited by about thirty vessels, mostly from Guayaquil, Lambayeque, and the ports of South America. The import sugar for the consumption of the country, and bullion and cacao for re-exportation. These goods are transported either on mules or by the natives on their shoulders from Panamá to Cruces, on the Chagres river, where they are embarked in boats, and go down the river to Chagres.
If a canal for large vessels could be made across any part of this isthmus, not only the communication between Europe and the countries of America bordering on the Pacific would be much facilitated, but vessels bound for China and the countries of Eastern and Southern Asia would prefer a voyage through the isthmus to any other, because, much more than that, having the Cape of Good Hope, would have the advantage of a continual favourable wind (the trades). The execution of such a canal has repeatedly been suggested; and Mr. Lloyd was sent, in 1827, by Bolivar, then president of the republic of Columbia, to the country, for the purpose of improving the communication across the Isthmus. Mr. Lloyd, in what he has written on the subject, does not speak of a canal, probably because in the then circumstances of the republic of Columbia it was an enterprise quite out of the question. His description of the country however shows that it may be considered next to impossible to make such a canal across the narrowest part of the Isthmus, opposite the Bay of Mandingo. It appears that though there are no obstacles to the execution of such a work in the surface and soil which could not be overcome, the climate is so unhealthy, that the lives of many thousands would be sacrificed, and probably the mortality among the workmen would soon stop the progress of the work. If a canal for large vessels across the Isthmus is practicable it will not be economy, but rather a trick by which lie between Panama and Puerto Velo, perhaps along the line which Mr. Lloyd proposes for improving the communication between the Caribbean Sea and Panama. This line would begin at La Ceiba, about forty-five miles east of the Gulf, which, though uninhabited, is an excellent harbour, and might easily be much improved. From this place the canal is to be made to the banks of the river Chagres, which is only two miles and a half from the harbour; and as this line is short enough to be a level, the canal could be made without locks. That river would then be ascended to its junction with the Trinidad river, and the latter to a place where its shores on the south bank are well suited for being converted into wharfs and landing-places, and the Trinidad or Chagres dammed, or Chagres lake formed. It should, however, be supposed that if a more minute survey were made of this country with the view of making a canal across the whole Isthmus a straighter and shorter line might be discovered. Mr. Lloyd estimates that the mean level of all of the coast in the Pacific two days after full moon is 21’22’ feet; and that the difference between the extreme elevation and depression occasionally amounts to 27’44’ feet. In the Caribbean Sea, at Chagres, the mean elevation of the tide is only 6’21’ feet; and that at Key West in the Atlantic is 13’55’ feet lower than in the Pacific.

History.—Columbus, in his fourth voyage, being in search of a strait which would conduct him to the Indian Ocean, discovered the whole coast between Cape Gracias a Dios and Barro Colorado Island, or Puerto Velo in 1502. He intended to plant a small colony upon the river Belen in Veragua, but was prevented by the insubordination of his crew from making the first European settlement on the continent of America. This was done in 1510 by Nuñez de Balboa, who built the town of Santa Maria, on the Gulf of Darien; and in 1512, in traversing the Isthmus, he discovered the Pacific Ocean. As the climate along the coast of the Gulf of Darien is very unhealthy, Pedrarias Davila removed the colony from Santa Maria to Panama; and the Spaniards, who were in quest of gold, soon spread over the coast of the Isthmus, and settled at several places. When the Spanish government divided its American possessions into large provinces, the Isthmus of Panama was incorporated into the province of Panama, and the settlement on the Isthmus was frequently taken and plundered by the Buccaneers, especially by Henry Morgan. In the beginning of the present century the Spanish colonies on the Tierra Firme obtained their independence after a long and bloody struggle with the natives, and the province of Panama, forming part of the department of the republic of Colombia, and afterwards of New Granada, under the name of Istmo.

(Lloyd, in the Philosophical Transactions for 1830, and the London Geographical Journal, vol. i.; Ullés’s Voyage to South America; Roberts’s Narrative of Voyages and Excursions on the East Coast and Interior of Central America; Haigh’s Sketches of Buenos Ayres, Chili, and Peru.)

PANATHENAIA (παναθηναία), the greatest of the Athenian festivals, was celebrated in honour of Athena (Minerva) as the guardian deity of the city ('Αθηνά θυάτηρ). It is said to have been instituted by Erechtheus, son of Hecaleus (Haropocrat, Πανστάτος), and to have been called originally Athenia (Αθηνία) but it obtained the name of Panathenaia in the time of Theseus, in consequence of his uniting the five annual religious festivals into one, independent state into which Athens had been previously divided. (Paus., viii., 2., 1.; Plut., Thes., c. 20; Thucyd., ii. 15.)

There were two Athenian festivals, which had the name of Panathenæa; one of which was called the Great Panathenaia; the other the Little Panathenaia (μικρὰ Παναθηναία), and was celebrated every five years with very great magnificence and attracted spectators from all parts of Greece; and the other, the Less Panathenaia (μικρὰ Παναθηναία), which was celebrated every year in the Piræus. (Haropocrat, loc. cit.; Plato, De Rep., l. 1.)

When the Greek writers speak simply of the Panathenæa, it is sometimes difficult to determine which of the two is alluded to; but when the Panathenæa is spoken of by itself, and there is nothing in the context to the contrary, the presumption is that the Great Panathenaia is meant; and it is thus meant of by Herodotus (v. 56) and Demosthenes (De Fals. Leg., p. 394). The Great Panathenaia was celebrated on the 28th day of the month of Hecatombatæon (Proclus, quoted by Clinton, Fast. Hell., p. 125). The festival lasted for ten days, and the expenses of the festival were defrayed partly from the account of Demosthenes (C. Timoc., p. 708, 789), who places it after the 12th day of the month. There is considerable dispute as to the time in which the Less Panathenæa was celebrated. Mouritsch places its celebration in Tharchon, or the 10th year of the Olympic cycle; but Corinna, in Hecatombatæon. Mr. Clinton, who has examined the subject at considerable length (Fast. Hell., p. 332-335), supports the opinion of Mouritsch; and it does not appear improbable that the Less Panathenaia was celebrated in the same month. In the Great Panathenaia, Midas celebrates his victory in the Hippodrome, and was perhaps on the 12th day of the month, which was the first day of the second wday of the great festival occurred. The celebration of the Great Panathenaia only lasted one day in the month of Hipharchus (Thucyd., vi. 56); but it was continued in later times for several days.

At Corinth the Panathenaia there were gymnastic games (Pind., Isthm., iv. 42; Pollux, viii. 93), among which the torch-race seems to have been very popular. In the time of Socrates there was introduced at the Less Panathenaia a competition for horses (Plato, De Rep., l. 1.). At the Great Panathenaia there was a musical pageant, and a recitation of the Homeric poems by rhapsodists. (Lycurg, C Locor., p. 209.) The victors in these contests were rewarded with vessels of sacred oil. (Pind., Nem., x. 64, and Schol.; Schol. to Pind., Nem., x. 64.)

The most celebrated part however of the Great Panathenaic festival was the solemn procession (σωματική), in which the Peupleus (πολιορκας) or sacred robe of Athena was carried through the Ceramicus and other principal parts of the city by a procession of shepherds and soldiers, which was called the processus in the city. This Peupleus was covered with embroidery (σταυροφύλακα, Plato, Euthyph., c. 6), on which was represented the Battle of the Gods and the Giants, especially the exploits of Zeus and Athena (Plato, loc. cit.; Eurip., Hecub., 746, and also the achievements of the heroes in the Attic mythology, whence Aristophanes speaks of 'men worthy of the land and of the Peupleus.' (Equiv., 564.)) The embroidery was worked by young virgin of the noblest families in Athens (called ἱπποτριφής), of whom two were superintendents, with the assistance of a master embrosser, and named the Peupleus. When the latter was brought down from the Acropolis, where it had been worked, and was suspended like a sail upon a ship (Paus., xxix. 1., 1.), which was then drawn through the Ceramicus, it was called the Peupleus of the city. The procession which accompanied it consisted of persons chosen from the citizens and foreigners resident at Athens as well as of citizens. The old men carried olive branches in their hands, whereas they were called Thalophori (θαλοφόροι), and the young men carried generally a panoply (πανοπλία) at least in the time of Hipparchus. (Thucyd., vi. 56.) The young women carried baskets on their heads, whence they were called Cephalo- w (κεφαλοφόροι). The sacrifices were very numerous on this occasion. During the supremacy of Athens every subject state had to furnish an ox for the festival. (Schol. to Ath. Nub., 385.) It was a season of general joy; even provincially accustomed to be liberatad, that they might take part in the general rejoicing. (Schol. to Demosth. Timoc. 184.) After the battle of Marathon, it was usual for the herald at the Great Panathenæa to pray for the good of
the Plataeans as well as of the Athenians. (Herod. vi. 111.)

The procession, which has been described above, formed the subject of the bas-reliefs which embellished the outside of the temple of the Panathenaei, which are generally known by the name of the Panatheniac frieze. The blocks of marble of which this frieze was originally composed, were three feet four inches high, and they formed a connected series of 292 feet in length. A considerable portion of this frieze, with the great splendor of the works of art, is in the British Museum, and is described in the "Elgin Marbles," published by the Society for the Diffusion of Useful Knowledge, vol. i., p. 161-231.

A full and detailed account of this festival is given by Mr. Burrow in his "Philippines." It is printed in the seventh volume of the "Thesaurus" of Gronovius.

PANAY. [PHILIPPINE ISLANDS.]

PANCake, a thin cake of batter fried or baked in a pan. The annual custom of frying pancakes (in turning or tossing which, in the pan there was usually a good deal of pleasantry in the kitchen) is still retained in many families of the better sort throughout the kingdom on Shrove Tuesday, and was formerly universal. The old and of the new world, and of which one species extends to the shores of the Mediterranean. They are mostly highly ornamental plants with white flowers, many of them fragrant: they are commonly cultivated in stoves, and require a mixture of light loam and rich vegetable manure. Many of them are known as "broom flowers." When grown in pots, they require frequent watering.

PANCRACTIUM, a genus of plants of the natural family of Amaryllids, having a funnel-shaped flower with a long tube. Six superior sepals, and as many stamens, which are inserted on the edge of a 12-cleft membranous cup. Pistil single. The name was applied by the Greeks to some plants allied to Scilla maritima, but which has not yet been made out by botanists. The name is now applied to a genus of ornamental plants, found in the equinoctial parts both of the old and of the new world, and of which one species extends to the shores of the Mediterranean. They are mostly highly ornamental plants with white flowers, many of them fragrant: they are commonly cultivated in stoves, and require a mixture of light loam and rich vegetable manure. Many of them are known as "broom flowers." When grown in pots, they require frequent watering.

PANCREAS is a secreting gland situated behind the stomach and extending from the spleen transversely across the vertebral column to the duodenum. In man it is of an elongated and slightly flattened form, broadest at its right side, thinnest and gradually narrowing towards the left. It is of a firm consistency, lobulated, and very similar in structure to the salivary glands, from which circumstance it is often called the salivary gland of the abdomen. It is chiefly composed of the ramifications of the main ducts, the various ramifications of which is poured into the duodenum by a separate aperture close to that of the bile-duct. [LIVER.] The trunk of the pancreatic duct, soon after its opening into the end of the bile-duct, or into the duodenum, dilates and passes along the middle of the gland, giving off on each side numerous branches, which, again and again dividing, terminate in minute cells or lobules, which are closed on all sides, and are congregated in bunches to form the principal lobes of the glands.

Upon the walls of these ducts and their peculiar terminations the blood-vessels are placed, which form a close capillary net-work, through whose walls the peculiar secretion is poured. This is aropy, slightly acid, and opaline fluid, very similar to saliva, containing a small quantity of albumen and some animal matter, the latter being assumed to assist in the office of assimilating the food, which, just before the pancreatic fluid is added, has been converted into chyme in the stomach, and is undergoing the process of conversion into chyle; but the exact nature of its function is at present unknown. [DIGESTION.]

The pancreas is found in its least developed form in fish, in some of which it consists of simple or slightly branching tubes or sacs, attached to the duodenum very near its commencement, and commonly called appendices pyloricus. In the amphibia and birds it gradually increases in the complexity of its arrangement, and it is most compact and most highly developed in the mammals.

Of all the organs in the body, the pancreas is probably the least liable to disease, and those from which it is occasionally found to be excised while in use are known by any peculiar symptoms.

PANDA, one of the names of the genus Ailurus (F. Cuv.).

On the 6th November, 1821, an elaborate description of this interesting animal by General Hardwicke was read to the Zoological Society of London. This animal is referred to all the languages of Europe, and most of the stories of which it is composed are familiar to persons conversant with modern literature; for instance, the story of the faithful dog killed by the haughty parent, after having successfully guarded his home. The only part of the animal which has been the subject of an accurate collection of fables, and also forms the object of a ballad ("Bath Gelliert"), is derived from the story of the faithful ichneumon in the fifth book of the Panicala-panica; and an incident from the story of Deu-Sarmé, in the first book, appears among other works in the Chrest. coupés de Guerin, in Massinger's "Guardian," and in Beaumont and Fletcher's "Woman pleased." The original text of the Panicala-panica has not yet been printed, but there is a translation of one of the, known by the name Hlydypus, (the friendly instruction), which is in the hands of all Roman scholars, and has been translated both by Sir C. Wilkins and by Sir W. Jones. It seems that the Panicala-panica was composed at or near the city of Mihipkur, or St. Thomé, in the island of Mihilopram, in the introduction to the book.

In the "Transactions of the Royal Asiatic Society," vol. i., p. 153, there is an admirable "Analytical Account of the Panicala-panica," illustrated with occasional translations, by Mr. J. Wilson.
Generic Character.—Head subglobose, great; face subrotund; cheeks tumid; forehead flat, elongated, broad; tongue rather rough; snout short, conical, very broad; rictus moderate; rhinarium obtuse; nostrils terminal; ears short, acute, distant, villous; eyes approximated to the rhinarium and placed anteriorly; maxilla integument; mandible subrecombite; a few white vibrissae. Neck short. Body large, cylindrical, obese, clothed with a very villous under-fur, and long, equal, rather soft hairs, downy at their base. Tail of the length of the body, very large at the base, cylindrical, subattenuated at the tip and clothed with very long spreading hair. Feet plantigrade, five-toed; the soles thickly clothed with a very fine down; claws calcinate, compressed, arcuate, very sharp (retroactile).

Dental formula:—Incisors, 6; canines, 1.1; molars, 3.5 = 36.

Example, Ailurus fulgens. (F. Cuvier.)

Description.—Body above beautiful fulvous brown, which becomes lighter on the back and assumes a golden hue. The brown colour extends with a somewhat deeper shade to the neck, the same as they are seen within. C, lateral view of the teeth in the lower jaw, as they appear without. E, the same as they appear without. E, front teeth; e, upper jaw; b, lower jaw. (Hardwicke, Linn. Trans.)

Teeth of Ailurus.

A, lateral view of the teeth of the upper jaw, as they are seen within. B, the same as they are seen without. C, lateral view of the teeth in the lower jaw, as they appear without. D, the same as they appear without. E, front teeth; a, upper jaw; b, lower jaw. (Hardwicke, Linn. Trans.)

Feet of Ailurus.

F, anterior foot, left side. G, posterior foot, right side. H, sole of one of the posterior feet, to show its hairy covering. (Hardwicke, Linn. Trans.)

Owing, in our opinion, to original structure, and is not produced by the wearing down of the points. We observe both in the skull of a young animal and in that of the adult specimen from which the annexed drawing was made, and our description is confirmed by a careful comparison of the relative elevation of the points of the two anterior grinders, in which, although they are equally exposed to attrition, this truncation is not observed. The margins bounding the truncated points, as is shown in the drawing, are circumscribed and perfect, exhibiting no signs of being worn down by attrition. In the disposition and even in the form of the teeth, our animal bears some resemblance to the genera Nasua and Procyon; but these differ essentially in the lengthened form of the head, and in the extended rostrum, which is terminated by a flexible rhinarium; they also differ in the number, character, and distribution of the grinders. Nasua and Procyon have in both jaws six grinders, of which the three anterior are false grinders; and of those which follow, none of the points, even in the adult state, exhibit the truncation above described. Our animal has only one false grinder with a compound crown, and the four posterior grinders are large and highly complicated; the first of these in the upper jaw corresponds with the fourth grinders in Nasua and Procyon, and the points are attenuated and acute; but the posterior grinders are quite peculiar and characteristic in their structure.

Habitus, &c.—General Hardwicke states that this animal’s haunts are about rivers and mountain-torrents. It lives much in trees, and feeds on birds and the smaller quadrupeds, and is frequently discovered by its loud cry or call resembling the word Wha, often repeating the same. Hence is derived one of the local names by which it is known. It is also called the Chitwan.

Locality.—Himalaya chain of hills between Nepal and the Snowy Mountains (Hardwicke, Linn. Trans., vol. v.) In Mr. Hodgson’s catalogue of the animals observed in Nepal (Zool. Proc., 1834).

Curvier declares the Ailurus to be one of the most beautiful of quadrupeds.
they grow. The male flowers consist of single stamens with two-celled anthers; the females of naked one-celled ovaries, with solitary ascending or numerous parietal ovules. The fruit consists of a mass of ovaries collected into a tuberculated head, and either dry and fibrous or fleshy and succulent.

These plants chiefly abound in the Mascarén islands and in the Indian Archipelago, of which they form a conspicuous feature. The species of Pandanus, Vaquesia, or Screwpine, are readily known by their spiral leaves, dichotomous habit, and the long roots emitted by the sides of their trunk for the purpose of holding it down in the loose sand among which they grow, in order to assimilate with the air, a partial exfoliation at the end, which is the form of a cup, adheres to the root, for the purpose, as is supposed, of holding water during the period that the root is passing through the dry air. The genus Freycinetia, on the contrary, is composed of plants with long scrambling or rooting stems, most like Pandanus, indeed so much as to become what can be called a tree; and, when in flower, adorned with gaily coloured spathes from which the young inflorescence protrudes. It can scarcely be said that the plants of this order are of any known use to man, except as vanishing, in common with many others, a good material for thatching.

PANDANUS, a name derived from the Malay Pandang, and that of a genus of plants, from which the natural family Pandanaceae are derived. The genus Pandanus, being so named from their leaves, which resemble those of the pine-apple, and are inserted spirally along the stem. The species are found in the islands of the tropical ocean, in those of Mauritius and Bourbon, as well as in the southern parts of India. One of the strongest cordials, which is said to be grant, is much esteemed in all Asiatic countries, either where it will grow or where its essence is known. It is constantly referred to by the Sanserit poets, as may be seen in Wilson's 'Hindu Theatre,' by the name Ketee, and as the Kaza and Ketee or the Hindus. The Arabs call it Kaze, and Avicenna describes it under the name of Armah. Oil impregnated with the essence of its flowers and the distilled water are highly esteemed both for their odour and their medicinal use as stimulants. Dr. Roxburgh states that it is the tender white leaves of the flowers, cloths of the male, which yield the very delightful fragrance for which this plant is so celebrated. This species is common in the peninsula of India, where it is called Calidea Bush; in Mauritius it, as well as other species, is known as the Vaques Plant; in Otaheite, a species is called the Wharra Tree, being all in highly esteemed for its odour, as well as for the useful purposes to which it may be applied. The lower pulpy part of the drupes is sometimes eaten, as is also the terminal bud, like that of the cabbage-palm, and likewise the tender white base of the leaves, either raw or boiled, during times of scarcity. It forms an excellent hedge, but occupies too much space. The roots are composed of tough fibres, which are used by basket-makers to tie their work, and are soft enough to be employed as wicks. The leaves are composed of tough longitudinal fibres, white and glossy, a quality which adapts them for covering huts, making matting, as well as for cordage in the South Sea islands, and in the Mauritius for making sacks for their coffee, sugar, and grain.

PANDECT. [JUSTINIAN'S LEGISLATION.]

PANDONIA. [BALD BUZZARD.]

PANDORA (Malacology). [PYLORIDANS.]

PANDUS. [MAHABHARATAM.]

PANEGYRIC (from the Greek 'panegyrics,' πανεγγυς, klygos) is a species of oration in praise of a person or thing, so called because such discourses used to be delivered in ancient Greece on the occasion of great public festivals before the whole assembly, "panegyria" of the people. The orator began by praising the deity who presided over the festival, such as Jupiter in the Olympic Games and Apollo in the Pythian; he then spoke in praise of the community or town in which the games were held, and lastly of the magistrates, the champions, and especially the victors who gained the prizes. Afterwards the name came to be applied to political orations delivered in the senate or council of a state in praise of that state or of the leading men or man in it. The panegyrical oration of Isocrates is a fine specimen of the kind, in which he commemorates the series of Athenian victories which it had rendered to Greece in general, and the whole with a view to nourish friendly feelings between it and the other Greek states.
The Panatheniac oration of Isocrates is another composition of the same class.

Under the Roman empire panegyrics were composed in praise of the emperors. Pliny's panegyric of Trajan is a well-known specimen of this kind. Panegyrics became frequent at the courts of the East and the West, in Greek and in Latin; they are mostly wholly written in a fulsome and adulatory style. We have panegyrics of Constantine, Constantius, Justinian, Theodosius, and many others, which, if consulted with discrimination, may be useful for several purposes and for supplying deficiencies in the historians of those times. Eunodius, bishop of Pavia, wrote a panegyric in praise of Theodoric.

Panegyrics have also been written in verse. The poem of Tibullus in praise of Messalla is a specimen of this kind, as well as similar compositions by Claudianus, Sidonius, and others.

In modern times panegyrics have been written by Roman Catholic preachers in honour of particular saints. Giordani, an Italian contemporary author, wrote a panegyric in praise of N.: by him, in appearance of acher Pliny. But the panegyric style seems no longer in accordance with the taste of our age, and its essential character is too laudatory to please minds of an independent cast.

**Panel**. This term in English law denotes a small square of parchment containing the names of jurors returned by the sheriff or ministerial officer for the trial of issues in courts of common law. The enrollment of the names upon this schedule is called *impanelling* a jury; the ministerial officer is also required to array the names in the panel. The etymology of the term is doubtful: Sir Edward Coke says, 'Panel is an English word, and signifies a little part, for a pane is a part, and a panel is a little part' (Co. Litt. 155 b). Spelman derives the word from *pallia*, a little page, supposing the g to be changed to n. (Spelman's Q. d. 3. *Panelia*). Both these etymologies seem to be incorrect. In the old book called 'Les Termes de la Ley, panel is said to come from the French word panne, a skin; whence in barbarous Latin might come *pallinio* or *panella*, signifying a little skin of parchment. This would denote the jury panel pretty accurately, and the history of its appearance as an expression in English procedure is consistent with its derivation from the French.

In the earliest records of the forms of jury-processes, as given by Glanvill, it appears that the sheriff was commanded by the writs in certain real actions to cause to be imbricated (imbreviari facere) the names of the jurors by whom the land in question was viewed. But at this time the word panel never occurs, nor is it used by Bracton, Fleta, or Britton, nor in any statute earlier than 20 Edw. 11 c. 6 (1349), which forbids sheriffs from putting suspected persons in arrays of panels. This was precisely the period at which the French language began to be fully introduced into our law proceedings. (Lauder's 'Tract on the Use of the French Language in Our Antient Laws.') This coincidence renders it not improbable that the word panel, from *pallinio* and *panne* may have been introduced with many other French terms about this period.

In Scotch criminal law, the accused, who is called a defendent till his appearance to answer a charge, is afterwards styled the *pallinio*. The etymology of this word also is doubtful. (Jameson's Dictionary, ad verb.) But it is possible that it may have the same origin as our English word, as in Scotch proceedings a prisoner is sometimes said to be entered in *pallinio* to stand trial. (Aarnon's Criminal Trials, p. 12.)

**Pangolins**, a name in common use to designate the *Scaly Ant-eaters*, said to be derived from the word *Pangong*, which signifies in the Japanese language, according to Seba, an animal which rolls itself into the form of a ball. The Bengalese name is *Badjorkita*, or *Reptile of stone*. These animals form the genus *Manis* of Linnæus. Like the *Hairy Ant-eaters* (*Myrmecophaga* [Arr. Edw.: *Tamanous*]), the *Pangolins* are toothless, and furnished with a very extensible tongue; but their tegumentary covering is very different, for their body, limbs, and tail are clad in a panoply consisting of great trenched scales overlapping each other like tiles, so as to form a sort of scale- armour when the animal is on its feet. When it is vigorously attacked, and often on the first approach of danger, it rolls itself up in the shape of a ball; and then the trenched scales are erected, and offer their sharp edges to the enemy.

**Geographical Distribution.** —The antient continent, &c., Asia and Africa.

We must first call the reader's attention to those parts of the organization of this form which are most worthy of notice.

**Organization.**

**Skeleton.** —[A more or less elongated cone, with the base rounded. Orbits small, round, occupying nearly one-half of its length, and situated towards the lower part of its sides; they are consequently very much separated from each other. The zygomatic arches are incomplete, and meet on a level with the palate. The bones of the nose are notched on their inferior border, and enter above into a notch formed in the frontal bones. The articulation of these with the maxillary bones descends obliquely to the orbit, and is continued in the same direction with the palatine bone. The posterior suture does not enter into the orbit; it terminates at the point where it gives off its zygomatic apophysis, which is short and pointed. The palatine bone itself furnishes, a little, the base of this zygomatic. There is no lachrymal bone, or, if there is one, it is extremely small, and hidden in the lachrymal bone, and pierced in the angle of the orbit. Within, between the frontal and palatine bones. The fronto-parietal suture is hardly angular backwards, but the occipital suture forms a fairly defined angle between the posterior borders of the parietal bones. Cuvier could not detect any interparietal bone. The anterior sphenoid bone is in the temple is far from reaching the parietal bone. The fronto-parietal bone is articulated with that and the temporal bone. The posterior sphenoid bone does not reach the frontal, but terminates opposite the origin of the zygomatic process of the temporal bone. In this place it contributes to the glenoid facet, which is sunk in front of the tympanic cavity. There is no jugal bone, and the temporal and maxillary zygomatic apophyses are only joined by a ligament. The tympanic cavity must be ossified at a late period only, for Cuvier never saw it except under the form of a vascular

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*Figure: Skull of *Manis panthera* (Linnaeus). Manis prucehymus (Erect).* a. seen from above; b, seen from behind; c, seen from behind; d, posterior.
There is indeed a large petrous bone behind it, but only at the lower surface of the skull. Above this part the temporal bone is timid, and contains a large canal which communicates with the tympanic cavity by means of a hole pierced above the ossicula. The intermaxillary bones are rather narrow, and rise obliquely to the half of the height of the nasal bones. Though there are no teeth, the maxillary and palate bones are timid along their sides, so that the middle of the palate forms a long demicanal. The palate bones terminate obliquely opposite to the gienoid face, and are continued from it by the pterygoid process of the sphenoidal bone, terminating in a hook within the internal side of the tympanic cavity. There is no external pterygoid apophysis; the internal one is not separated from the sphenoid bone. The suborbital hole is small, and its very short canal opens under the origin of the zygomatic arch. The lachrymal bone in the internal angle of the arch is also large. There are in the palate bone two holes corresponding to the spheno-palatine foramina. The anterior orbital bone is situated between the frontal and the anterior sphenoidal bone. The optic hole is moderate. The spheno-orbital is round and large. The oval is distinct, and entirely in the sphenoid. The condyloidean bone is large, but the posterior and carotid groove are small.

Internally the sella turcica is moderately elevated: the enbrain plate is very large, and divided by a very large and very bony coxcomb-like crest, separated also from the rest of the cranium by a projecting bony ring.

The skull of Mowes tetradactyla (Linn.), Manis Macrura (Erxl.), the Phatagin of Buffon, differs from that above described in being more slender, and also presents the singularity of having, where the lachrymal bone should be, a great oval piece without any hole, which, Cuvier believes, belongs to the ethmoid bone.

*Extremities.*—There is a general resemblance in these portions of the skeleton in the Hairy Ant-eaters and the Pangolins; but there are particular differences, as in the scapula, &c., some of which we shall notice. Both of these groups are remarkable for the great size of the lower part of the humerus, produced especially by the projection of the internal condyle destined for the attachment for the powerful flexors which work the claws. In the Hairy Ant-eaters the head of the radius is nearly as round as it is in man and the Quadrumanes, having a very complete rotatory power; but it is not so in the Pangolins, which have the articulation of this part by the method termed ginglymus. The orbit and radius are both robust, and are constructed with proportions and views very different from those to be observed in the Sloth, among which they are so greatly prolonged as to be hardly fit for anything but suspension from trees. (At, vol. i. p. 231.) In the Ant-eaters they have all the strength necessary for tearing down the nests of the Termités, on which they feed; and, as it might be expected, the fore-feet of these quadrupeds is, next to their skull, the most remarkable part of their skeleton. The unequal phalanges of their large toes are, like those of the Sloths, so disposed as not to be capable of curvatura in any other direction than downwards; and in effect held in that position, the state of repose, by strong ligaments. In the Pangolins their point is forked, whilst in the Hairy Ant-eaters it is only furrowed, and has at its base a strong bony sheath for the insertion of the claw. In the Pangolins the general structure of the fore-foot is the same as in the Hairy Ant-eaters; but besides the differences above noticed, the scaphoid and trilunar bones of the carpus are confluent, forming a single piece, as in the Carnivora. In the Pangolins there is, too, less irregularity in the proportions of the toes, though in them, as well as in the Hairy Ant-eaters, the middle one is stoutest and longest.

The pelvis in all these animals exhibits the singularity of the ischium uniting with the last vertebra of the sacrum, which is furnished with apophyses for its reception, so that instead of the ischiatic notch there is a hole, which at first sight has the semblance of a second oval hole, a conformation observable in the Sloths and Armadillos. In the Pangolins the os illi, which is of a prismatic form, and terminates in front by a tuberosity, is articulated also to the last lumbar vertebra; but this is not the case among the Hairy Ant-eaters, where this bone is besides flatter; in both it is oblong, and not widened as in the Sloth.

The great trochanter is less elevated than the head of the femur; in the Hairy Ant-eaters there is a trenchant crest the whole length of the external edge of the bone; and in the Pangolins the whole bone is wide and flat from before backwards, but there is no third trochanter. The lower head of the bone is as wide as it is long, and the rotular pulley is wide but not deep. The tibia and fibula are very distinct: the former is very complete towards the lower part; the latter is rounded in front; its lower head is wider than it is long, and becomes a convex pulley (not projecting much) in its middle part. The astragalus corre-
sponds to this in the form of its upper head, the lower only corresponds to the scaphoid bone, and is concave, as it is in the Sloths, which is remarkable; but the articulation of the astragalus with the tibia has none of that singular obliquity observable in those animals. The hind-foot of the

**Hairy Ant-eaters** and the **Pangolins** is as solid as that of any animal. The calcaneum is compressed at its posterior apophysis, and is united to the astragalus as in most animals. In the tarsus there is a scaphoid bone, which is convex on the anterior side of its articulation with the astragalus, but curving behind that bone; a cuboid longer than it is wide; three trapezoid bones, the internal of which is double that of the others; and a supernumerary bone articulated on this internal cuneiform bone, and which in the **Tamanoir**, **Tamandua**, and the **Pangolin** is triangular and very small, but in the **Little Ant-eater** is elongated and widened so as to form a sort of heel. This species of calcaneum, it is true, is very short, not going farther backwards than the astragalus itself. It is this supernumerary bone which gives to the sole of the foot of the **Little Ant-eater** that concave form which renders it so fit for grasping branches and climbing trees.

**Bones of the Trunk.**—The Pangolins are remarkable for the strength of their caudal vertebrae, and for the extended width of their transverse apophyses: there are forty-seven in the tail of **Manis maculata**, and only twenty-six in the tail of the **Short-tailed Pangolin**, which has three sacral, six lumbar, fifteen dorsal, and seven cervical vertebrae: in the **Phatagin Cuvier** found only thirteen dorsal and five lumbar vertebrae. The spiny apophyses of the back and loins of these two animals are square, as in the **Tamanoir**.

The ribs of the **Tamanoir** and the **Ant-eater** (**Fourmilier**) are remarkable for their size; those of the latter often cover each other like the portions of certain cuirassiers. There are sixteen in the **Tamanoir**, ten of which are true, seventeen in the **Tamandua**, eleven of which are true; and fifteen in the **Ant-eater** (**Fourmilier**), nine of which are true. This last is also the number in the Pangolin, which has besides a slight vestige of a sixteenth, but in the **Phatagin Cuvier** found but thirteen. The sternum of the **Tamanoir** and **Tamandua** is very remarkable on account of a double body, which each of the bones possesses, a cylindrical part within the breast, and an external compressed part. The cartilages of the ribs, which are ossified, have at their extremity two heads separated by a notch, and which articulate with these two parts, and always between two sternal bones. Each of these last leaves between it and its neighbour as the skeleton a vacant space, which traverses the sternum from right to left. The first of these sternal bones is very much widened and notched in front; the last is nearly rectangular. In the **Little Ant-eater** this last is cylindrical.

The Pangolins have the bones flat, eight in number, of which the three penultimate are placed transversely, and the last of all, which is very long, cylindrical, and forked in the Pangolin (flattened in the **Short-tailed Pangolin**), terminates in two strong tendons, which, in the latter, reach to the pelvis, and greatly assist the animals in rolling themselves into a ball.

Generic Character.—Lower jaw very small; tongue very extensible. Body and tail entirely covered above with large triangular trachetant scales disposed quincunxically, and overlapping each other like tiles. Toes five, armed with robust claws. Body endowed with the faculty of rolling itself up more or less into the form of a ball.

Dental formula: - 0.

Habits, Food, &c.—The Pangolins are slow in motion, and live on worms and insects, especially termites and ants, which they seize by means of their extensible and glutinous tongue.

**Asiatic Pangolins.**

**Manis pentadactyla**, **Indian, Broad-tailed, or Short-tailed Manis**, **Manis brachyura** of Erxleben, and probably the **Phatag of Alian** (xvi. 6).

Description.—Head small, pointed, and conic; muzzle elongated and narrow; body rather stout; tail short and very broad at its base; dorsal scales disposed in longitudinal rows to the number of eleven; under part of the body, head, and feet naked; some long fair-coloured hairy spring from under the scales. Middle claw of the forefoot far exceeding the others in its proportions.

Locality, Food, &c.—The East Indies, coast of Tranquebar, &c. Feeds principally on termites, or white ants, for the destruction of whose conical nests the great middle claw is admirably adapted. Thunberg states that it is found much in Ceylon, especially near Negombo. The Dutch call it the **Negroe Asa** or the **Cobail**. Its flesh was even to the sick to eat by way of remedy. Thunberg further informs us that the inhabitants have a method of making a hole in its skin with a knife, and thus of guiding and governing the animal at their pleasure, the point of the knife, which is inserted in the bulbs, pushing and irritates him. The cruelty of this proceeding does not however seem to have struck the traveller, The **Land Carp** is also an Asiatic name for this species. It is the **Kueaier Manjar**, or **Tied Cul** of the Malayans, according to Colonel Bykes, who notices it as very common in Dukhun (Deccan), and living on white ants. Mr. Hodgson, in his catalogue of the quadrupeds of Nepal, mentions a new species of **Manis allied to Manis Javanica**, Desm., as being of frequent occurrence in the hills of the lower region, and in the mountains of the central tract. (Zool. Proc., 1830, 1831, and 1834.)

**African Pangolins.**

The **Phatagin of Buffon** appears to be the **Long-tailed Pangolin** (**Manis tetradactyla**, Linn.; **Manis maculata** Erxleb.). This species is from two to three feet in length; and the tail is twice as long as the body; the scales are pointed.

Locality.—Senegal, Guinea, &c.

But we shall illustrate the **African Pangolins** by the **Manis Temminckii** (Smou). Mr. Bennett described this species from a specimen in the collection made by Mr. Steedman in South Africa: and he stated that his object in calling the attention of the Society to it was to point out the external characteristics of a species known to its original describers by its skeleton alone and a few detached scales; and he characterised it as

**Manis** with a rather short head, a rather wide body; the scales large, and in eleven rows; the tail as long as the trunk, rather less than that in width, and hardly narrower at the subtruncato apex. Length 25½ inches; of the tail 12 inches; width of the back 8 inches; of the tail near the apex 3 inches.

Mr. Bennett observes that the most remarkable features of this animal are the shortness of the head, the breadth of the body, and the breadth of the tail, which is nearly equal to that of the body, and continues throughout the greater part of its extent of nearly the same width, tapering only slightly towards the end, where it is rounded and almost truncate. Mr. Bennett further remarks that a peculiarity in the distribution of the scales of **Manis Temminckii** is the cessation of the middle series of them at a short distance

**Skeleton of Short-tailed Pangolin.** (Cuvier.)
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FEATHERS to the extremity of the tail, so that the last four transverse rows consist of four scales each, each of the pre-
receding rows linking five. (Zool. Proc. 1834.)

Dr. Smith describes it as having the scales pale yellowish-
brown, the colour lightest towards their points, many of
which are marked with a longitudinal yellow streak; parts
ever covered with scales, dusky brownish-yellow. Eyes redish brown; muzzle black behind of the fore-feet a pale
dull yellow; those of the hinder ones brownish-yellow.

The same author points out that *Manis Temminckii* is readily
to be distinguished from any of the other species yet
described, simply from the central row of scales upon
the upper surface of the tail, terminating some way behind
its point. From *Manis pentadactyla*, Lin., the species to
which it bears most similarity, it is moreover to be distin-
guished by all its scales being proportionally larger, and by
those on the head being shaped and disposed differently.
The greater part of the tail, as a more characteristic feature
of its marginal plates, also afford marked characteris-
tics by which the species is easily to be recognised from
*Manis pentadactyla*.

Locality.—Mr. Bennett gives Latakoo. Dr. Smith says
that only one solitary specimen of this species was obtained
by the Expedition before reaching 26° S. lat., and but too
more between that parallel and the tropic of Capricorn,
though others were known to have been captured in the
former tract, where they were usually traversing it.
He thinks it very questionable if the animal be so rare
in nature as the result of their experience might incline men
to believe. He is of opinion that its extreme scarcity prob-
able arises from its having long been zealously sought after
by the natives, who cherish a belief that it either has some
influence upon cattle, or, at least, that certain observances
in respect of it have an effect upon them. Whenever a
specimen is secured it is submitted to the fire in some cattie
pen, apparently as a burnt offering, for the increase of the
health and fertility of all cattle which may afterwards enter
that fold. Dr. Smith states, that not many years ago a
specimen was captured in the northern part of the Cape
colony, which renders it probable that the species was, at
one time, scattered over the whole of South Africa, and that
its almost total disappearance from the southern districts has arisen from causes such as are now operating to
check a similar result in the interior. Here we have another
cause for the obliteration of a species. Intolerance of their
aggression has wrought up the shepherd and the agricul-
turist to the destruction of some; but, in this case, a species
is probably dying out under the influence of a superstition.

Habits, Food, &c.—Dr. Smith relates that when *Manis
Temminckii* is discovered, it never attempts to escape, but
instantly rolls itself up into a globular form, taking especial
care of its head, which is the only part that can escape injury.
Ants constitute its chief and favourite food, and these is
secured by extending its projectile tongue into holes which
may exist in the habitations of these insects or which it may
itself form; and when, by means of the glutinous matter
with which they are invested, a sudden retraction of the retractor muscles carries both into its mouth, after which the ants are immediately
swallowed. (Illustrations of the Zoology of South Africa.)

**Fossil Pangolins**

M. Schleyermacher called the attention of Cuvier to a
bone of which he sent the great French zoologist a plaster-
cast. This bone had been found (together with many
ossaceous remains of *Rhinoceros*, *Mastodon*, *Hipopotamus*,
and *Tapir* near Eupelodium, in the canton of Alvein, in
that part of the ancient Palatinum belonging to the
Duchy of Hesse) in a dike whence sand and gravel were
dug, which seemed to have been accumulated by the allu-
vum of the Rhine. Cuvier was soon satisfied that this bone was the upper part of a series of a gigantic stature very
pituflous, and came to the conclusion, which has not
been disputed, but on the contrary entertained by many best
qualified to judge, that it belonged probably to a Pangolin
gigantic stature. Taking this unguifer bone for his basis,
M. Schleyermacher thought he had found for his opinion who
ventured to pronounce 'ex pede Herculem,' Cuvier measured
the animal to which it must have belonged as having ex-
tended to the length of twenty-four feet. Nor will this
inordinate length stagger those who know the enormous
portions which characterised some of the extinct Sau-
rians.

**Geological Position.**—Tertiary. Miocene of Lyell.

**PANGUTARAN.** [SULU ARCHIPELAGO.]

**PANICLE** is a kind of inflorescence, or arrangement of
flowers, in which the axis is divided into a number of lateral
branches, each of which is again subdivided into other
branchlets. Examples of it will be found in the Liliaceae,
the Agrostis stolonifer, and the Horse-chestnut.

**Panicum** is a genus given the name of which is
applied to one of those species (*Millet* or *Romania*),
and which, *Platyza*, is so called from its flowers being in
a panicle; though others derive the name from *panis*, bread,
from its use as such. The genus contains a very large
number of species which abound in the hot parts of the world,
though a few extend to higher latitudes and are found in
the cool mountains of hot countries. They are chiefly
valuable as pasture grasses, and for their seeds, which form a
large portion of the food of the poorer classes of many
nations, and thus engage a considerable share of the atten-
tion of the agriculturists of those countries.

The genus *Panicum* is distinguished by having a two-
flowered spikelet, with the lower flower masculine or neuter,
and the upper hermaphrodite. *Giumae* two, unequal,
convergent, abruptly acute, bent; *Millet* two, convergent,
the upper palea and the stamens abortive. *Fer-
tile flowers* pales two, unequal convoluted, the lower one
embracing the upper. *Scales* two. *Stamens* three. *Styles*
two, ovary sessile.

*P. millet*, or *Millet*, is the best known species, being
cultivated in the south of Europe as well as in tropical
countries. Two varieties are well known, one brown, the
other yellow-coloured, imported from the Mediterranean
chiefly for feeding poultry, but forming in the south of
Europe a portion of the food of the poorer inhabitants.
In the latter country it is cultivated in the cold weather
with wheat and barley, and the only one of the small
grains that is so at that season of the year. It is the
*natives* of the Hindus, Arab dakhun, Persian zarnun. *P. Mi-
niace* is another species generally cultivated, it is a
rich soil in the peninsula of India: the seed is one of the
sorts of dry or small grain which forms an article of diet of
the Hindus who inhabit the higher lands, and cattle are
fed on the straw.

*P. frumentaceum*, which is the sharna and sanaul of
the natives of India, is a wholesome and nourishing grain,
and forms there an article of diet chiefly of the lower classes.
There are several varieties of it, which yield from 50 to 60
barley, it delights in a lightly and tolerably dry soil, and
ground yields two crops between the first of the rains in
June, July, and the end of January, in the Cirem, but only
one crop in the northern provinces. Besides these, which
are the most commonly cultivated species, the grains of other
species of *Panicum* are cultivated in a wild state in those
habitats. In the latter country it is cultivated in the cold
weather with wheat and barley, and the only one of the small
grains that is so at that season of the year. It is the
*natives* of the Hindus, Arab dakhun, Persian zarnun. *P. Mi-
niace* is another species generally cultivated, it is a
rich soil in the peninsula of India: the seed is one of the
sorts of dry or small grain which forms an article of diet of
the Hindus who inhabit the higher lands, and cattle are
fed on the straw.

The uses of this grain are not confined to its grain,
for the herbaceous part of several species forms the most
valuable of the pasture grasses of the hot countries both in
the old and new world. Some of the species of *Panicum* of the
Brazils are of gigantic stature, and yet tender and delicate in
their herbage. The Copia de Angola of Brazil grows 7
feet high, and other species of this genus are cultivated
for the field crops on the banks of the Amazon; while *P. ma-
ximum*, or Guinea grass, forms the most valuable pasture for
cattle in Jamaica. This is said to have been introduced into that island from the coast of Africa, the seeds having being transmitted as food for some birds which were sent to Chief Justice Ellis. The straw of several of the species is esteemed as fodder for cattle in India, but no pasture grass in any country is more highly preferred than the buffalo grass (Bubalus bubalis) of India, which by the Brahmins is held sacred to Ganesha (Janus?) under the name of dooruth. This is fortunately the most common species throughout India, and forms probably three-fourths of the food of their herds and cows. It is a hardy plant, but European cattle in the northern parts frequently form lawns by planting small pieces of this grass, which forms excellent hay. The usual mode of obtaining it is to send out the grass cutters into the uncultivated parts of the country, who scrape off the turf and separate the stems and leaves of the species, which is easily distinguished by its smooth and creeping habit: its spikes being fascicled and digitate, filiform, from one to two inches long, with the flowers disposed in two rows on the under side. It is the Panicum Daucylon of botanists, and occurs also in England.

PANINI, the most celebrated of the Sanscrit grammarians, is said to have been the grandson of the inspired legislator Dēvala, and lived at so remote an age that he is reckoned among the fabulous ages mentioned in the Vedas. (See Colebrooke, Asiatic Res., viii, p. 392.) With regard to his death we have the following tradition in the Hitopadesa: — 'It is related that the valuable life of Panini was destroyed by a lion.' The Indians consider him as their great grammarian, but his work is confessedly derived from earlier treatises on the same subject; he often quotes his predecessors Śācalya, Gārgya, and others; and it appears from a passage in the Bhagavad-Gīta, that the nomenclature of grammar existed when the great epic poem, the Mahā-Bhārata, was composed, unless the following line is an interpolation of a later age: akhārānāṃ dārśu amsi: dvandvaṃ sāmkhīyasya-ca, 'I am the A of letters,' says Chrishtna, 'and the copula which connects the elements of the compound word.' (Bhalg. Git., x, 5, 3.)

Pāṇini's grammar consists of 3996 short aphorisms, or sutras, divided into eight books, in which the rules of grammar are delivered with such oracular brevity and obscurity that they need a commentary to render them intelligible even to the learned Indians. Besides the Cāndita of Bhartrihari, a brother of king Virāvāma (Amara), there were the following treatises, written expressly to illustrate it: 1, the Bhāṭihṛiṣya, which was nominally a poem describing the adventures of Rāma, but really a collection of all the different forms in the noun, published at Calcutta, 1826; 2, the Mahā-Bhāṣya, or 'great commentary,' by Patanjali.

A new edition of Pāṇini is in the course of publication in Germany, with a growing title and a set of the finest European editions, and some of those buildings which are still the ornaments of modern Rome. He formed his style of composition and his entire manner after the works of Ghiolló, in which he was so successful that he could form any number of the best and most effective works of the art. His paintings are universally esteemed for the grandeur of the architecture, the correctness of the perspective, and the clearness of the colouring. His figures also are designed with taste, and cleverly grouped. In general, his buildings are rather too large for the rooms to which they were applied. His works were distinguished by freedom and breadth of touch, but in colouring and effect they are more fine than the paintings of other artists.

There are several pictures by Panini at Rome, of a country-house belonging to the king of Sardinia, representing views of that seat and the environs.

PANIONIUM. [Ion.]
Pannonia possessed several towns of importance, the inhabitants of which appear to have principally depended for their subsistence upon the cultivation of a certain grain which was quartered in different parts of the province. Following the course of the Danube, the first town we come to after leaving Noricum is Vindobona (Vienna), called Vienonima by Pliny (iii. 27), who places it in Noricum. At the time of Ptolemy it was called Juliobona, and was the site of a legion. It is called by later writers Vindobona; but in the "Notitia Imperii" it is written Vindomana. The next town of importance below Vindobona on the Danube is Carnuntum, which, in the early part of the Roman empire, was the most important place in the northern Pannonia. It is mentioned by Velleius Paterculus (ii. 109) and Pliny (xxxvii. 11, sec. 2). It appears from the account of Pliny to have been a place of considerable commercial importance. The amber which was collected in the northern part of Europe was taken from the sisters, and thence conveyed to the different parts of the Roman empire.

It was the head-quarters of the army of Marcus Antoninus in the war which he carried on with the Marcomanni. (Eutrop., viii. 6.) In the time of Annianus Marcellinus (xxv. 5), that is, in the later part of the fourth century, it was almost without any population. Its ruins are in the neighbourhood of Altenburg. We learn from an inscription found in this spot that it was a municipium ("Probus Decrrio Municipi Carnuntensii").

Below Vindobona was Brigantium or Bregetium (Fusto), called by Annianus Marcellinus (xxxv. 6). Bregetum, the station of a Roman legion, where the emperor Valentinian died, while making preparations for a war against the Quadi. Following the course of the Danube, we next come to Carnuntum, the principal town in the province of Bavaria and the station of a legion. The Romans had a military station on the other side of the river, which was called Contra Aecenum. South of Aecenum on the Danube, is the place of Ucinum. The Romans called Bononia (Ann. Marcell. xxxv. ii. 9; xxxvii. 11); and below it were Acenium or Acenicum (Peterwarden) and Taurumun (Semlin), the most easterly town in the province, near the confluence of the Savus and Batava.

The most important towns in the southern part of the province were Siscia (Brissac), Cibalis or Cibalas (Palahna), and Sirmium (Schabasz), all on the Save. Siscia, which was upon the borders of Illyricum, was the most important town in Pannonia in the time of Augustus. It was called Segestica by Strabo (vii. 313), but Pliny (iii. 28) gives this name to an island near Siscia, which is formed at the confluence of the Save and the Sava. Dio (xlix. 17) also calls the town Siscia. We learn from Pliny that it was a royal town or city of the Danube district below Siscia. It was memorable for the defeat of Licinius by Constantine, and was the birth-place of the emperor Gratianus. (Ann. l. c., xxxv. 24.) Sirmium, which was below Cibalis, was, under the later Roman emperors, the principal town of Europe was brought to this town, and belonged to the Scordici, and is mentioned by Strabo (vii., 314) and Pliny (iii. 28), the latter of whom states that it was situated at the confluence of the Sava and Danube. It was the residence of the Roman emperors when they visited the province from Adrianople (consul 15) that there was an imperial palace in the town.

On the Drave, near the confines of Noricum, was Petovio or Pertorio, which is mentioned by Tacitus (Hist., iii. 1) as the winter-quarters of the thirteenth legion. Petovio, or Pertorio, on the Sava, near Murisia (Besag), a colony founded by Hadrian. (Steph. Byz.) At Murisia the fleet of the Lower Danube was stationed, and near it Magetunus was defeated by Constantius. (Zosimus, i. 43.)

The only town of importance in the north-western part of the province was Sabaria (Steinmanger), a Roman colony founded by the emperor Claudius. (Plin., iii. 27.)

PANOPTICON. [BENTHAM; PRIOR.] PANORAMA (from the Greek word παν, all, and ραμα, view), a picture showing a view completely around the spectator. This ingenious pictorial contrivance was first devised by an English artist, Robert Barker, about the year 1794; and it is not a new mode of painting—the process itself being similar to that of the terrestrial globe, and that of the terrestrial earth upon which the cow-dung, into whose roots their width will promptly increase.

PANTALIARI. [SICILY.]
PANTHEON. A very celebrated and well-preserved monument at Rome, of which Valerius of Ostia is said to have been the architect. It consists of a rotunda with a noble Corinthian octastyle portico attached to it, and resembles in its general mass the Colosseum in the Regent's Park, London, except that the body of the latter building is a polygon of sixteen sides, and its portico (a true Doric hexastyle) is only a single intercolumn in depth. That the portico of the Pantheon was erected by Agrippa, the son-in-law of Augustus, is testified by the inscription on the frieze: 'M. Agrippa, L. F. Cons. Tertium Feot.' Yet some doubt is felt as to whether he meant to have erected an edifice so similar to one originally designed by his father-in-law that it would be a lumpish and heavy mass. If so, he refused the idea of the rotunda having been originally a temple, but an entrance to public baths; it is certainly wider than any temple of Romans both in their temples and other buildings, on which account their architecture presents a variety that does not occur in that of Greece. Despoiled as it is of rich ornaments, gilded bronze-work, and statues, of which it was plunne in the middle ages, it is considered the finest specimen of a Christian church in the seventh century,—further, disfigured by two ugly belfries erected by Urban VIII., whose family name Barberini gave rise to the memorable papal question, 'Quod non fecerunt barbari fecerit Barberini.'—The Pantheon is still the pride of Roman architecture, and well justifies Akenides's character of it: *Mark how the dreed Pantheon stands Amid the toys of modern hands; How simply, how severely great!*

It is by far the largest circular structure of ancient times, the external diameter being 188 feet, and the height to the summit of the upper cornice 102, exclusive of the flat dome or calotte which makes the entire height about 458 feet. The dome is, as has been said, is octastyle, yet there are in all sixteen columns (of 24 feet high) between and 12 columns of the same height by the return of the portico it would have been a lumpish and heavy mass. If so, he refused the idea of the rotunda having been originally a temple, but an entrance to public baths; it is certainly wider than any temple of Romans both in their temples and other buildings, on which account their architecture presents a variety that does not occur in that of Greece. Despoiled as it is of rich ornaments, gilded bronze-work, and statues, of which it was plunne in the middle ages, it is considered the finest specimen of a Christian church in the seventh century,—further, disfigured by two ugly belfries erected by Urban VIII., whose family name Barberini gave rise to the memorable papal question, 'Quod non fecerunt barbari fecerit Barberini.'—The Pantheon is still the pride of Roman architecture, and well justifies Akenides's character of it: *Mark how the dreed Pantheon stands Amid the toys of modern hands; How simply, how severely great!* It is by far the largest circular structure of ancient times, the external diameter being 188 feet, and the height to the summit of the upper cornice 102, exclusive of the flat dome or calotte which makes the entire height about 458 feet. The dome is, as has been said, is octastyle, yet there are in all sixteen columns, by 2 columns of 24 feet high) between and exclusive of those at the angles, and two others behind the third column from each end, dividing the portico internally into three aisles or avenues, the central one of which is considerably the widest, and contains the greatest doorway within a very deep recess, while each of the others has a large semi-circular tribune or recess. But although, independently of the recessed parts, the portico is only three intercolumns in depth, its flanks present the order continued in pilasters, making two and a half closed intercolumns, and the projection there from the main structure about 70 feet; which circumstance produces an extraordinary air of majesty. The columns are 47 English feet high, with bases and capitals of white marble, and granite shafts, each formed out of a single pier of about 7 feet in diameter; and in thickness of the wall forming 23 feet through the piers, between the exedrae, or recesses, which, including that containing the entrance, are eight in number, and each, except that facing the entrance, is divided into three intercolumns, by 2 columns of 24 feet high) between and angular pilasters; while the intermediate piers are occupied by eight smaller projecting tabernacles. But as, besides being repaired and altered by Septimius Severus, the interior has undergone many changes, or rather corruptions, it is hardly possible to know what it was. Hirt supposes that all the recesses were arched, and, except the one for the entrance, contained colossal statues of Roman deities, and that there were no columns in front of the entablature, but an insular column on each side, with the entablature of the piers breaking over it, whereas the entire circumference was divided into sixteen equal intercolumns formed by as many columns. Yet the projection of the columns, and the breaks in the entablature, as well as the other inferior later additions, would have destroyed the unity and simplicity of the plan. But that which effect of the columns and narrow intercolumns in the recesses, and the effect of shadow thus obtained, would have been lost. The greatest defect of all is the change of the spacious nave of the building, and the remains of the columns are consequently divided into oblong pannels over the recesses, filled with reliefs, there can be little doubt that the general appearance would have been materially improved, and that with greater simplicity and greater richness also would have been obtained. The dome has five rows of coffers (now removed) in the same way as the central, 26 feet in diameter, which not only lights the interior perfectly, but in the most charming and almost magical manner. Indeed there has scarcely ever been but one opinion as to the captivory effect thus produced, and the most exquisite beauty of the whole, and general proportions. As an interior, Greek architecture has nothing whatever, we will not say that rivals, but that even approaches it; nor does it say any thing more correct for modern architects, that, with such an example before them, they could scarcely fail to look upon the Pantheon in regard to those qualities which constitute its excellence, namely, the richness of columnation and great depth of the portico, and the simple majesty of proportion and captivating distribution of light in the interior, producing an effect so greatly superior to that of any modern dome or cupola.

It was Michael Angelo's boast that he would suspend the dome of the Pantheon aloft over the centre of St. Peter's, and if he meant no more than a dome equal in magnitude to the Pantheon, I am sure he would have been satisfied with the effect of being within a capacious rotunda of which the vaulting itself occupies one half the entire height, you look up into that of St. Peter's and most other modern ones are quite as good, or even great. As for the effect of illumination, I am sure that the light of our own St. Paul's for instance, the dome exhibits within only a sort of darkness visible—a murky gloom through which may be discerned the twinkling of the lantern on its summit. Almost the only tolerable correct imitation of general effect in this respect is that of the Pantheon, where every other respect his dome is totally dissimilar from it. Instead of being within a capacious rotunda of which the vaulting itself occupies one half the entire height, you look up into that of St. Peter's and most other modern ones are quite as good, or even great. As for the effect of illumination, I am sure that the light of our own St. Paul's for instance, the dome exhibits within only a sort of darkness visible—a murky gloom through which may be discerned the twinkling of the lantern on its summit. Almost the only tolerable correct imitation of general effect in this respect is that of the Pantheon, where every other respect his dome is totally dissimilar from it. Instead of being within a capacious rotunda of which the vaulting itself occupies one half the entire height, you look up into that of St. Peter's and most other modern ones are quite as good, or even great.
are of a circle of any radius, G at the same time is describing an arc of a circle of half the radius, so that C moves in a direction perpendicular to A G C twice as fast as G. Now it was shown above that it moved twice as fast as G in the direction A G C, and as by the composition of these two motions, all lines, whether rectilinear or curved, are produced, it follows that the pencil at G will produce a copy half the size of the original traced over by the point at C, as before stated.

To produce a copy one-fourth the size of the original, we must shift the pencil from G to g, and the fulcrum from A to a, a.g being one-fourth the length of A C, and so on for all other proportions less than half, the constant rule being.

"As the distance of the pencil from the fulcrum is to the distance of the fulcrum from the fulcrum, so will be the size of the copy to that of the original." No calculation is required in practice, as the arms A E and E D are graduated for all proportions from one-twelfth to eleven-twelfths inclusive. If it be required to produce a copy more than half the size of the original, the fulcrum must be placed on the arm E D, and the pencil on A E, the rule above given still holding good, so that for a copy the same size as the original the fulcrum must be placed at G, and the pencil at A. It must be borne in mind, however, that when the fulcrum is on the arm E D, the copy will be inverted.

Though the principle of this instrument is as simple and complete as can be imagined, yet it falls sadly short of perfection in practice.

In the first place the numerous joints and castors, however carefully constructed, make it heavy to the hand in comparison with the unfettered pencil, and it requires much practice to be able to manage it so dexterously as to get those minute and gentle undulations, necessary not only to the beauty but to the utility of the drawing. The pencil itself is too constant moving up to, does not maintain that fine point which is required for distinctness of outline, and to these faults we must add inaccuracy of workmanship, however slight, the effect of wear, inequalities of the paper, and other accidents.

The best way to test an instrument is to reverse the position of the tracer and pencil, thus producing a copy larger than the original, when the defects will of course be exaggerated in proportion.

The pantograph, however, though it cannot be depended upon for an accurate and finished copy, is of great service to the draughtsman, for by it may be marked off all the principal points through which to draw the lines of a plan with equal accuracy and in a manner more than by any other instrument can be used for the purpose.

The annexed engraving represents a pantograph of very recent invention, which possesses some advantages over that before described.

In the first place, the fulcrum being in the centre, it requires but one castor, which is placed at C, and makes it work much lighter in hand than the old instrument, which has six, as before described; besides which these six castors are frequently a great source of annoyance by getting off the edge of the drawing-board and running over drawing-pins or any thing else which may happen to be in the way. Secondly, the shape of this instrument allows it to move as freely when nearly closed as when opened wide, which is not the case with the other. The simplicity of its construction renders description almost superfluous.

It is composed of six bars, moving freely, all of which are assembled at the six equal and jointed junctures so arranged as to length that A P and T B are always parallel to each other. F is the fulcrum, furnished with a socket and screw (s), through which the centre bar can be moved, and which can be fastened down at any of the graduations on that bar. This socket, with the bar, turns upon the pin.
In modern times pantomimic balls, representing an entire dramatic action or fable, have become a favourite scene performance. The Tuscan Angiolini, in the last century, and after him Violati, who died at Milan in 1821, have excelled in this species of composition. Noverra, in France, distinguished himself likewise in the composition of pantomime 'ballots.' This kind of performance now forms generally an appendage to the opera, and especially the Italian opera.

Menander, the greatest of the Greek Socrigellor, Storia Critica de Teatri antichi e moderni.

PAOLA. (CALABRIA.)

PA'O'LLI, PASQUALE DE, was born in 1776 in the village of Reggio, in the jurisdiction of Basta in the island of Corsesia. In 1734 his father Giacomo and his mother, Annabella Giaffetti, was proclaimed their leader against the Genoese by the revolted Corsicans, but after a struggle of several years, in which the adventurer Theodore figured, Giacinto was obliged by the Provost, which some Genoese, who were defeated near Nice, and obtained leave in 1740 to withdraw from the island with his younger son Pasquale. [CORSICA; NEXHOPY.] Clemente the elder son remained in Corsica. Giacinto and his son went to Naples, where the father married a Cornese, and except the maritime towns of Bastia, Calvi, San Fiorenzo, and Ajaccio, in which the Genoese garrisons were blockaded by the natives, and at last the Corsicans obtained possession of Ajaccio also. But Paoli engaged to encounter a more dangerous enemy than the Genoese, in the theatre among his subjects. By Matra, who, through jealousy or bibles, or both, excited a civil war, in which he was defeated and killed, and his brother was obliged to take refuge at Genoa. Meantime Paoli obtained a regiment formed of his, and fixed its government and administration. He formed a national assembly, under the name of ' Consulta Generale,' of 500 deputies, elected by the body of the people, one for each commune the members were renewed every year; only few were elected to be returned as deputies. The executive consisted of nine men, elected by the deputies. Paoli was the president of the executive, with the title of General of the Kings and Chief of the Supreme Magistracy of Corsica. He had a son named Paoli, whom he educated in the art of war, and he would have no guard at the door of his apartments, trusting to the fidelity of six large fierce mastiffs which watched and slept in his room. A law of the legislative assembly forbade under severe penalties any person for speaking or writing against the general or the executive council. In 1764 Paoli established a university in the town of Corte, the professors in which were paid by the nation, and the students taught gratuitously. The funds for the new university were furnished by the French troops. A French army of 15,000 men was placed under the command of a general, and the military force consisted of militia well trained to the use of arms; Paoli could collect 30,000 men in case of necessity. He also formed a flotilla, with which he annoyed the Genoese trade, and took possession of the island of Caprera. The Pope Clement XIII., at the request of Paoli, sent to Corsica a bishop with the title of Apostle Visitor, in order to regulate the ecclesiastical affairs, which were in a state of confusion. This step was followed by the promulgation of a recognition of the independence of Corsica, greatly displeased the republic of Genoa, which offered a reward of 3000 crowns to any one who should arrest the bishop and deliver him over to the Genoese authorities, forbidding at the same time all subjects of the republic to observe mass. The pope published an edict against the resolutions of the
P A O

Sciutto senate, which he characterized as iniquitous and an insult to the apostolic authority. The quarrel lasted for some years, and employed the pens of jurists and controversialists on both sides.

Genoa, despairing of ever recovering the sovereignty of Corsica, resolved on giving up the island to France. This was effected by the treaty of Versailles in 1768, a dishonourable and disgraceful contract to both parties. Paoli loudly and eloquently appealed to all Europe against the cession, but no one took notice of Genoa's interests, and the French; as a large force in Corsica, well provided with artillery and ammunition, under the command of Count Marbeuf. Paoli determined upon resistance, and was seconded by the whole population, including the women. The Corsicans fought desperately; the French, determined to be avenged, they defeated the French with great slaughter on the banks of the Golo; and again on the 9th October, 1768, they routed the main body of the enemy, commanded by Marbeuf in person, with the loss of two thousand men. In the following year, large reinforcements came to the French from Toulon under General de Vaux. In May, 1769, a general battle took place, in which the Corsicans, after fighting bravely, were completely routed near Pontenuovo. The French entered Corte, and overran the whole island. Most of the Corsicans fled to Italy or Sicily, and Paoli with many followers, retired to Portoveschio, from whence he sailed in an English vessel for Leghorn, where he was kindly received by the grand-duke Leopold. Paoli afterwards repaired to England and France, where he was received in the National Assembly the recall of all the Corsican patriots who had bravely fought for the independence of their country. Paoli repaired to Paris, where he was received with acclamations, and in the hall of the Assembly he promised fidelity to France. His spirited and eloquent speeches as soon arrived in Corsica, and his name was placed on the lists of proscription. Paoli now saw it was high time to declare himself. He assembled his countrymen, by whom he was appointed general-in-chief and president of the council of government. At Genoa, on the 12th of January, 1773, he applied to the English commanders in the Mediterranean, and, with their assistance, drove the French garrisons out of the island. Soon after, a deputation of the consuls proceeded to London to offer the crown of Corsica to the king of Great Britain; they were, however, told by the Corsicans expected that Paoli would have been appointed viceroy, but Sir Gilbert Elliot was named to that office. This and some subsequent disagreements made it desirable for Paoli to leave the island, in order not to give a pretext for civil discharges; his countrymen to remain firm in their allegiance to the British crown, as their only means of salvation, he returned to England, where he lived in retirement for several years, on a pension which the British government allowed him. He died near London in February, 1797. A monument, with his bust and an inscription, was raised to his memory in Westminster Abbey.

The biography of Paoli has been written by Pommereul in 1787, in a hostile and unfair spirit; Boswell, on the contrary, has given a very correct account of his life, and his usual critical talent is fully displayed in his "Vita di Paoli," the "Storia d'Italia," book 46, gives a copious narrative of Paoli's career in Corsica. A volume of Paoli's letters, containing the most interesting events of his life, including the memorable battles of Pontenuovo, Portoveschio, and the capture of the fleet in the sea, and divided from the shore by a steep descent, over which there is no carriage road, so that all the goods which are imported or exported are transported on the backs of mules. The plain of Piratinis, on which the town is built, has an undulating surface; the hills have gentle slopes, and are covered with trees, and the level tracts between them are extensive savannahs, which make excellent pasture-ground. The streets are wide, and some of them paved, and the houses have usually two floors.

Sant' Anna di Stilo, on the right bank of the Stifone, is a village and a small town built on the hill, from which there is a fine view of the sea, and of the coast. It is a pleasant spot, and is the seat of a monastery, the church of which is ancient, and contains some beautiful paintings. The town is surrounded by walls, and has a castle, which is now in a ruinous state. It is celebrated for its salt, which is produced in the neighborhood. The district is divided into three parishes, which are under the jurisdiction of the archbishop of Catanzaro. The chief occupations of the inhabitants are agriculture and fishing. The climate is healthy, and the soil fertile. The town is supplied with water from a spring, which is said to have been discovered by a hermit, who lived in a cave near the place. The church of St. John the Baptist is ancient, and contains some beautiful pictures. The district is rich in coal and iron, and is supplied with water from a spring, which is said to have been discovered by a hermit, who lived in a cave near the place. The church of St. John the Baptist is ancient, and contains some beautiful pictures. The district is rich in coal and iron, and is supplied with water from a spring, which is said to have been discovered by a hermit, who lived in a cave near the place. The church of St. John the Baptist is ancient, and contains some beautiful pictures. The district is rich in coal and iron, and is supplied with water from a spring, which is said to have been discovered by a hermit, who lived in a cave near the place. The church of St. John the Baptist is ancient, and contains some beautiful pictures. The district is rich in coal and iron, and is supplied with water from a spring, which is said to have been discovered by a hermit, who lived in a cave near the place. 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from north to south, from the mouth of the Po at Goro to
Monte Circello, which is the most southern point, is about 250
miles: the breadth is very unequal, being about 120 miles in
its extreme north along the coast of the Mediterranean, but
it is hardly half that distance farther north towards the
middle of its length, owing to the frontiers of Abruzzo pro-
truding considerably to the westward. It becomes still
narrower near Pesaro and Rimini, where, being straitened
between the Adriatic and the Apennines on one side and the
frontier of Tuscany on the other, it is hardly 20 miles across. Farther
north it becomes wider as it stretches into the plain of the
Po, and it is about 50 miles, from east to west, from the
Adriatic to the frontiers of Modena and Ferrara, according to
Neugebaur and other German writers, at 17,822 English square
miles. Calindri (Saggio Statistico) reckons it 16,117 square Roman
miles. Of these, 7,900 square miles consist of plains, about
4,000 square miles of mountains, the cultivated hills, 4,000 are high-
lands covered with pasture or planted with timber-trees, and
2,500 are mountains mostly rocky and barren.

The Papal State consists, geographically speaking, of three
great divisions: 1. The northern provinces stretching
along the Tuscan Apennines to the Abruzzi and the Adriatic, the
ground sloping to the north and north-east, and merging
into the wide plain of Lombardy. These provinces are the
four legations of Bologna, Ferrara, Ravenna, and Forli, and
have a population of about 500,000 souls. The Miti of
Trastevere indicates the north of Italy in its climate
and soil, and belongs almost entirely to the basin of the
Po. [BOLOGNA: FERRARA.] In ancient times it was
out of the limits of Italy Proper, and formed part of Cusane
Gaul; and even now it is inhabited by their charmed
and ransomed, or rather, semi-Lombard neighbours than
their fellow-subjects of the rest of the Papal State, from
whom they are divided by several offsets of the Apennines,
which approach close to the Adriatic coast in the neigh-
bourhood of Rimini, though not within the political boundary of Italy Proper in the time of the Roman
republic. South of this point begins the second geographical
division of the Papal State. 2. This, which may be called
the eastern division, extends from Rimini to the Tronto on
the frontiers of the Adriatic, along the Adriatic coast. It is
bounded to the west and south by the central ridge of the Apennines, which separates it from
the southern part of the Papal State, or the basin of
the Tiber. This eastern division lies almost entirely on the
eastern slope of the Apennines, the numerous offsets of
which run in parallel ridges in a north-east direction from
the central chain to the Adriatic coast, forming many trans-
verse valleys watered by streams or torrets which have a
shallow course. The dividing ridge or watershed to the Adriatic varies from 30 to 40
miles. The country is fertile and healthy, and inhabited by
an industrious and lively race of people. It is generally
designated by the name of the Marches, and the people are
called Marchigiani or Marchesi. [Marches.] This region is
administratively divided into the provinces of Pesaro
Urban, Ancona, Macerata, and Fermo or Ascoli, the united
population of which amounts to about 800,000 inhabitants.
3. The third or southern division of the Papal State, the
largest in extent, though not densely populated as the
other two, is the most important, because it contains the
metropolis, and includes the classical land of Latium and
the other provinces which formed the early territory of
ancient Rome. It extends south from the central ridge
of the Apennines as far as the coast of the Mediterranean, being
bounded on the west by Tuscany and by the kingdom of
Naples on the east. This fine region comprises the ancient
territories of Umbria, the Sabini, old Latium, and the
western part of Bruttia, and is further divided into the
administrative provinces of Perugia, Spoleto or Rieti, Viterbo,
Frosinone, and Rome, with a population of about 900,000
inhabitants. Its length from north to south, from the Apen-
nines above Gubbio, the ancient Iguvrinum, to the shore of
the Adriatic at Ancona, is about 180 miles, and its greatest breadth, from the small river Pesca, on the boun-
dary of Tuscany, to Terracina, on the borders of Naples, is
120 miles. This extensive country is divided, with re-
spect to land and produce, into high and low lands and the
valleys of the Apennines, including the valley of the upper Tiber, which are well cultivated and
generally healthy; and the low lands of the Campagna and
some other spots around the lakes of Perugia, Bolsena, and
Bracciano, which are unwholesome and thinly inhabited. [Caserta, or Rossano.] There are few towns in Italy
than the broad valley of Foligno and Spoleto, the valley
of Terni, the elevated plain of Rieti, and the rich territory
around Perugia.

The central ridge of the Apennines, which forms the
bordered between the Adriatic and the Mediterranean, enters
the Papal State from Tuscany north of Città di Castello,
and runs in a south-south-east direction, forming for a
while the eastern boundary of the valley of the Upper
Tiber, and dividing the waters of the Metaurus, which rises
in the eastern province of Foligno, from those of the Tiber.
The road from Rome to Pesaro by Norcia passes over this part of the ridge, between Guadalo and
Cagli. Near the latter town is a defile cut through the
rock by the ancient Romans, now called Il Furlo. East
of Norcia, those of Abruzzi, and those of the Topino, which flows southwards by Foligno into the Tiber. Farther south-east there is a depression, through which the road follows the high road from
Norcia, and Ancona. This mountain-pass, which lies between
Serravalle and Foligno, is known by the name of the pass of
Colloriotto. South of this pass the Apennines form a lofty
ridge extending to the eastward, and known by the name of
Mons Vetus, which is 2,700 feet high, and is the highest summit in the Papal State: it divides the waters of the Tronto, which flows to the
Adriatic, from those of the Nerco, which flows south-
ward into the Tiber. The ridge then joins the mountains
of the Abruzzi, which, the Musa and the Abruzzi, forming an
offsets detach themselves from the main ridge above the
sources of the Nerco, and run south, skirting the two banks of
that river as far as its junction with the Tiber. The
more eastern offset is intersected by the Velino, which
flows south-west through the valley of the Vesuvius, and
its full course is marked by the face of the Tiber. The
country eastward of the Nerco consists of high lands, which
are interspersed with torrents and narrow ravines, but
seldom visited by travellers. [Rieti.]

The southern division of the Papal State chiefly consists
of the basin of the Tiber. This river rises at the foot of
Monte della Balze in the upper Apennines, and not, as
is often erroneously stated, in the mountains of
Falterona near the sources of the Arno, from which those
of the Tiber are about 20 miles distant to the east-south-
east, the lofty ridge Dell'Alverna intervening between the
two streams. The Tiber then flows for a distance of 400 miles, from the sources in the
Adriatic, has its sources on the north side of the same
mountain on the south slope of which are those of the
Tiber. The Tiber rises from two springs of limped water in
a wood of beech-trees, and, being swollen by mountains,
flows through the valley of the Gubbio, which is called
Val Tiberina, between the mountains Dell'Alverna
and Catenia on the west and the Alpe della Luna on the
east, which last forms part of the main or central ridge of
the Apennines, and separates the waters of the Tiber from
those of the Metaurus. The river passes by the feet of
Pieve Santo Stefano and Borgo San Sepolcro, after which it
receives the river Soara, and soon after leaves the
Tuscan territory and enters the province of Perugia in
the valley of Spoleto. [Tiber, in the Antologia of Florence, Nos. 10 and 11.] It
then flows by the walls of Città di Castello, and after a
rapid course of about 50 miles from its sources it reaches
the foot of the hill upon which stands the town of Perugia:
the river then flows through the little valley below, left
bank the united waters of the Chiascio from the moun-
tains of Gubbio, the Topino from Foligno, and the
Moroggia, joined by the Citisimus, from the valley of
Spoleto; and lower down, on its right bank, the river Nos-
a, which flows from the same source as the Tiber, also
flows through the valley of Terni. The river then enters a narrow gorge between two
rocky ridges, on one of which stands the town of Todì,
the ancient Tuterdum or Tetrur, a city of the Umbri and after
wards between two perpendicular cliffs of more than 300 feet above the sea.
Part of the walls of Todì is of Etruscan
structure, and in its territory has been found a vast quantity
of Etruscan medals and other antiquities. [Caserta,
Elogium in priemum Tuderii Decorem, 442, 1632; Letar,
Todi, antichissima Civitá dell' Umbria, 1633.) The bottom of the river here falls about 2 feet in every 1000 feet, and the bed being confined and partly embowered by stones and gravel is thought of from the mountain, the water in flood times as high as 24 feet, but the river is very shallow in the dry season. The navigation of the river, which, from Perugia to Todi, is carried on merely by rafts, becomes here totally interrupted. The Tiber, after receiving the Naia and Frasca rivers from the opposite bank, which are a rapid called 'Passo del Follero,' after which it enters a broad valley. It receives near Orvieto the river Paglia from the mountains of Tuscania, which is swollen by the waters of part of the Chiana. [Chiana.] The river now assumes the aspect of a mountain stream, the course is deep bed and inclining to the south-west. It receives the Vezza from Montefiascone, and lower down the Nera, the largest of its affluents, near the town of Orta. The whole course of the Tiber, from its sources to the confluence of the Nera, is about 390 miles. From this point the regular navigation of the Tiber begins: boats of various sizes, some of which are 60 feet long and of 50 tons burden, carry to Rome wine, corn, charcoal, wool, and other produce of the country. In ascending the river, they are towed up by buffaloes.

The Nera, the ancient Nar, a considerable river, rises in the high Apennines above Norcia, and is increased by the waters of part of the Abruzzo and of the Papal province of Rieti. The river on its course receives the Gendolla and the Turano. Flowing through a deep valley between the Sabine Mountains on one side and the mountains of Spoletto on the other, which divide it from the valley of the Clitumnus, it passes the towns of Terni and Narni, and, after a course of 176 miles, discharges itself into the Tiber. After the confluence of the Nera, the Tiber flows through a valley between the Sabine Mountains on one side and the offsets of Mount Cimino on the other; it receives on its right bank the united waters of the Treia from Civita Castellana, and of the Thurno, after it united with the lake of Vico, after which the valley becomes contracted between Mount Sorace on the west and the mountains of Poggio Mireto on the east. After this contraction, it opens into the wide undulating plain of the Campagna. Three miles south of Rome it receives the Fonte Romana, a spring from the eastern Apennines, which has a course of above 60 miles. The course of the Tiber, from the confluence of the Nera to Rome, is about 70 miles, in which distance the width of the river varies from 160 to 500 feet, the depth from 8 to 22 feet, and the fall is about one foot in every 8000 feet. Boats are three days in coming down from Orta to Rome, but in summer the navigation is often interrupted, owing to the shallowness of the water in several places. Water transport is assisted by the carriage on mules of cattle and from 12 to 18 feet in depth. The river is never fordable in or near Rome. During heavy rains and floods the waters sometimes have risen more than 30 feet above their ordinary level, overflowing the lower parts of the city, and occasioning great inundation. The quays and buildings of the town, spread out to the width of 600 feet, until its bifurcation at Capo dure Rami, a distance of 18 miles from Rome. From thence one branch of the river runs south-west into the sea by Ostia, a distance of about 3 miles, but is rendered useless for purposes of navigation by the accumulation of alluvium and sand at the mouth. [Ostia.] The other branch, which was widened by Trajan, and has been improved at various times by the popes, in order to maintain the communication of the sea, runs for about 4 miles, until it enters the sea at Fiumicino, where the entrance is secured by two long piers consisting of wooden palings and fascines. In winter time vessels from 130 to 190 tons, besides smaller vessels, call at the port of Rome. The Tiber to Rome is not more than 9 or 10 feet of water on the bar, and only boats of 40 or 50 tons can ascend to Rome. There is no perceptible tide in this part of the Mediterranean, and the vessels are towed up by boats, which take out, in August or September. The 'tabelle' of taxes for this year, or budget, in which are specified the probable expenditure of the following year and the means for meeting it, including additional local taxes if required. This 'tabelle' is forwarded to the delegate, who examines it, and then forwards it to Rome, where the book called 'il ragione del Buon Governo' approves or modifies it. The 'tabelle' is then returned to the commune, who publish it, upon which it be

Bresciano, the waters of which enter the sea by the river Arno. The Tiber, below Rome, receives only some small streams, the principal of which is the Galera, on its right bank. The basins of the lakes of Bracciano and Nemi, which are separate from that of the Tiber, constitute, together with the basin of the river Flora, near the Tuscan border, the greater part of the province of Viterbo, called also Patrimonio di S. Pietro. [Viterbo, Provincia.] In the south direction, the river Sacco, which separates the basin of the Tiber from that of the Liris, of which the Sacco is an affluent. [Palestrina.] With those rivers that enter the river Tiber on the right, the waters of the river from the central Apennines to the sea, is included in the basin of the Tiber, which also comprises a considerable part of Abruzzo, the waters of which country run by the Corno, Velino, Salto, Turano, and Anio, into the Tiber, and also that part of Tuscania in which the river has its source, and another part farther south, near Radiofone and Chiusi, which is drained by the rivers Paglia and Chiana. The whole basin of the Tiber may include a surface of rather more than 50,000 square miles, and is divided into 1,200,000 or more parishes. The Tiber is the most important river of the peninsula part of Italy. The waters of the Tiber from Perugia downwards to the sea are muddy and yellowish, a peculiarity which is expressed by the epithet 'fuscus.' As the river approaches the sea, where it enters the Mediterranean, it continues its journey, and as it enters the Mediterranean, it continues its journey, and on its way it forms the delta of Rome. The delta of Rome, which is about 80 miles in length and breadth, is the soil of Italy, and is inhabited by the government in 1833, was 5,742,000 inhabitants. The annual increase of the population appears to be at the rate of 41 per 1000, which is considerably lower than in the kingdom of Naples, in Tuscany, and other Italian states. The inhabitants of Rome are divided into three classes: the first is the Papal, consisting of Papal subjects, of whom the majority are Catholic, with the exception of about 10,000 Jews, who are distributed in Rome, Ancona, Siena, Lucca, Pesaro, Urbino, Folli, Bologna, Ravenna, Ferrara, Benevento. The population of Rome is about 1,200,000, and according to the census of 1843, was 5,742,000 inhabitants. The annual increase of the population appears to be at the rate of 41 per 1000, which is considerably lower than in the kingdom of Naples, in Tuscany, and other Italian states. The inhabitants of Rome are divided into three classes: the first is the Papal, consisting of Papal subjects, of whom the majority are Catholic, with the exception of about 10,000 Jews, who are distributed in Rome, Ancona, Siena, Lucca, Pesaro, Urbino, Folli, Bologna, Ravenna, Ferrara, Lago, and one or two more towns. The provinces, with the exception of that of Rome, are styled districts, and the representative of the sovereign, who is at the head of the administration, is styled delegate, and is always a church dignitary. If a cardinal, he is styled legate, and the province assumes the name of Legazione. The delegate or legate of a province is appointed by the pope, and is therefore appointed by the pope. There is also in every province a provincial council for local and financial affairs, whichassemble for a fortnight once a year under the presidency of the delegate or legate. For this purpose the communes are grouped into districts, called 'quartieri,' and the districts called 'quartieri,' and the smaller towns, and of eighteen in villages which do not contain 1000 inhabitants.

The members are taken in equal proportions from two classes, nobles and citizens or farmers. The office of communal councilman is for life and hereditary. The councils deliberate upon the affairs of their respective communes, and also upon all things relating to the public peace and order of the commune, or budget, in which are specified the probable expenditure of the following year and the means for meeting it, including additional local taxes if required. This 'tabelle' is forwarded to the delegate, who examines it, and then forwards it to Rome, where the book called 'il ragione del Buon Governo' approves or modifies it. The 'tabelle' is then returned to the commune, who publish it, upon which it be
comes law, and no magistrate can depart from its provisions. The communal council appoints yearly, by a majority of votes, the local magistrates, namely, the gonfaloniere, and six, four, or two elders, according to the size and population of the commune, subject however to the approbation of the delegate. The gonfaloniere, who must be chosen from the class of the nobility, is changed every year, and the elders every two years. The communal council appoints likewise all other servants, such as the secretary, the communal attorney, the receiver, the surgeon and apothecary (who for a fixed salary is obliged to attend the poor inhabitants gratis), the schoolmaster, the local police, &c. In the month of February the council examines the accounts of the preceding year, and transmits them to the delegate. The councils are always presided over by the gonfaloniere or by the governor in the head town of a district, who has a vote. The former baronial jurisdictions, privileges, and immunities have been abolished. (Cours d'Hist. de l'Annee, &c., 5 October, 1824.) 'This system of municipal administration,' observes Count Tournon, who was prefect of Rome during Napoleon's usurpation, 'will perhaps surprise those who imagine that in the Papal State everything is in the hands of the pope. The price of power are common, no doubt, but the written law is more favourable to the liberties of the people than is commonly supposed.' (Etudes statistiques sur Rome, vol. ii., pp. 41, 72.) The laws are in fact more independent of central authority than those of France. The common lands were sold by Pius VII. in order to supply the urgent wants and exactions of the French military. The ordinary revenue of the communes is now derived from taxes levied upon the property of all classes of the community, and the extraordinary deficiency is made up by a capititation tax and a tax upon cattle. The expenditure consists of administrative, judicial, and police salaries, the repairs of the roads, public buildings, fountains, &c., the emoluments of the gonfaloniere and apostolic vicar, schoolmasters and prescher who comes during Lent and Advent to deliver sermons adapted to those epochs. In the larger towns there are schoolmistresses, called Maestre Pie, paid by the commune for the elementary teaching of girls. Every Sunday after the Mass the boys assemble in the school and are instructed in the 'doctrina,' or catechism, explained to them by the rector or his assistant, and be examined upon it. Still there is no universal system of elementary instruction enforced as in North Italy, and the proportion of illiterate people in the Papal States is still greater than in the rest of Italy. The universities are those of Rome, Bologna, Perugia, Ferrara, and Macerata. There are also 21 colleges or grammarias, four at Rome, and the others in the chief towns of provinces. Females of the higher classes are chiefly educated in these universities.

With regard to the central government, it is an elective monarchy; the pope for the time being is the absolute sovereign of the state; he consults the cardinals assembled either in special congregations, or, in cases of great importance, in the general council or synod. His two principal ministers are the cardinal secretary of state and the cardinal Camerlingo. The former superintends the department of foreign affairs and the home department; he is appointed by the reigning sovereign, at whose death his office expires. The cardinal Camerlingo is the finance minister, and is appointed for life; he has under him a treasurer. The governor of Rome is under the authority of the secretary of state, but is vested with great powers, and acts as the representative of the capital and its territory. The congregation or board called 'Sacra Consulta,' consisting of cardinals and prelates, superintends the administration of the provinces, and is also a court of appeal for criminal matters. A prelate and three general officers form the council of war. The army is divided into three military divisions, with an inspector at the head of each; the head-quarters are Rome, Ancona, and Bologna. The army consists of ten battalions of native infantry, 7200 in all; two Swiss regiments of two battalions each, 4840; native cavalry 1000 men, and artillery 1000; two companies of Swiss artillery, 250; the carabineers, who have the charge of the police like the French gendarmes, 2500 strong; a corps of riflemen, 1000; and 1500 custom-house guards; total, 16,740 men. There are also several battalions of the gendarmerie. The judicial department consists of a judge, called Pretor, for civil matters in the head town of every province; two courts of appeal, one at Rome and the other at Bologna; and a Court of Cassation, called La Segnatura, which sits at Rome. There is also a Court of Assizes, known as the High Court of Justice, consisting of a chief judge and a number of assizes for suits between clerical persons, and also between laymen who agree to bring their disputes before these courts. For criminal matters, there is a collegial court in every province, presided over by the delegate; and two courts of assizes, one at Rome and the other at Bologna. The abbot of the收益 is laid before the sovereign, the 'Uditore Sisinni,' a private of the first class, judges finally of the case. The tribunal of the Inquisition and other ecclesiastical courts continue to take cognisance of matters within their respective jurisdictions, and certain serious crimes, such as heresy and cruel suffering punishment at the end of the year 1825, given by Serristori, there were 580 tried for murder or homicide; 277 for wounds inflicted, 340 for robbery, 215 for thefts, 811 for petty larceny, 91 for rape, 76 for political crimes, 66 for certes at Rome. The ecclesiastical courts in each diocese are only intermediate courts; the crimes not defined; in all, 2708. It appears from this report that offences against the person still bear a very high proportion in the calendar of the Papal State. The penalties are imprisonment and hard labour either for life or for a certain number of years. The capital is reserved for the most aggravating cases. Torture has been finally abolished.

Tribunals of commerce are established at Rome, Bologna, Ancona, and some other of the principal towns.

The revenue amounts to about nine millions of Roman scudi. It is at present, as it has always been, called a mixed revenue, a mixture of public and private, and has been considerably exceeded by the expenditure for several years past, the deficit having been made up by additional loans and issues of exchequer bills. The interest of the funded debt is 8,547,000 scudi; the collection of the revenue £1,040,000; one million and a half; the military establishment costs about two millions; the judicial establishment, nearly one million; the administration, half a million; the civil list of the pope and his court, 255,000 scudi; payments to the cardinals, 150,000; pensions, 100,000; public instruction, 108,000; charitable establishments, 267,000. The principal sources of the revenue are the land-taxes, which amount to nearly two millions of scudi; customs, one and a half million; excise, including the 'macerato,' or duty on sugar, 1,120,000 scudi; stamps and registry duty, 575,000; postoffice, 288,000; lottery, 896,000.

The population of the Papal State is chiefly agricultural. A great extent of land is used for pasture. The exports are wool, tallow, cheese, butter, hemp oil, candles, vitriol, sulpher, pozzolana, potash, and cream of tartar. The salt-panns of Cervia and Comacchio, near the Adriatic coast, supply most of the salt for the consumption of the country. Vitriol is found near Viterbo, slum at La Tolfa near Civita Castellana, sulphur near Rimini, and coal near Pesaro and Scagiano near Forli. Wood and charcoal are the only fuel used.

The manufactures of the Papal State are of more importance than is generally supposed. Count Tournon, thry in his great genius and learning, and the pope himself, who told the world that 'the sale of relics and indulgences constituted the whole commerce of Rome, and the manufacture of beads and saints' images the only industry of the people,' (Etudes Statistiques sur Rome, b. iii.) But since Tournon's time, manufacturing has considerably increased. One of the principal and oldest branches is that of woollen cloths, which are made in various towns of the state, and chiefly supply the internal consumption, and of a quality suitable only for the poorer classes. All the manufactures are on the increase at Rome and Bologna. Tanneries are established, chiefly at Ancona, Bologna, Pesaro, and Scaggnola. The manufacture of paper is also on the increase, as well as that of hats. Manufactures of soap are about two millions of scudi; those of candles, 500,000; of hosiery and lagosceuro, near Ferrara. There are iron-smelting furnaces at Bracciano, Canino, and Concasa, and iron-works in various other places. There are glass-works in several towns, and plate-glass is made at Poggio Mirteto. Two cotton manufactories have been established at Grottamare, near Fermo, and an extensive
The maritime trade of the Papal State is carried on chiefly by foreigners. This is the branch of industry most neglected by the natives of the Papal State. Even the coasting-trade of the principal ports has been largely carried on in great measure by foreign boats. The Neapolitan fish all along the Mediterranean coast, and the Venetians along that of the Adriatic, as far as Cesenatico; the native boats fish only along the coast of the Marches from Rimini to the Tiber estuary; they are never seen fishing far out to sea; and often they are only seen taking on its own coast. The consumption of fish is very great, owing to the number of feasts days in Lent, and at other times, which are ordered by the church of Rome, and enforced by the civil laws of the country. Fish are generally served at every meal. The tons of fresh fish throughout the Papal State amounts to thirty millions of pounds weight. Austrian vessels, to the number of 400, carry on most of the trade in the Adriatic ports of the state; and Neapolitan, Genoese, and Tunisian vessels or boats, in those of the Mediterranean coast. On the Adriatic coast the natives of the Papal State possess about 280 vessels, chiefly small craft, and about 500 fishing-boats. The Papal navy consists of an armed schooner, stationed at Civitavecchia, and a few vessels, the old, the "Muzza," and the "Mare." According to Calendrini (Saggio Geografico Statistico dello Stato Pontificio) the number of monks, friars, and other clergy living in communities in the Papal State amounts to about 10,500, distributed among fifty various monastic orders or communities; that of the nuns and other women living in cloisters, is 6000. In 43,300 individuals of both sexes devoted to religious celibacy, which is about 1 for every 22 of the whole population. The number of adult lay persons of both sexes who have been assisted by the church in marriage is about half a million, 60,000 in a state of widowhood, whilst that of married persons is 913,500. The rest of the population consists of children of both sexes. There are in the whole state 106 towns, and 728 "terze," or large villages having a population of 1000. Savings' banks have been established during the last years at Rome, Ancona, Bologna, and some other towns; an insurance company has been formed at Rome, as well as a bank, with a charter for a limited period. The principal products of the Papal State are: 1. corn, namely wheat, barley, rye, and Indian corn, which are produced in great quantity in the northern and eastern provinces. 2. oil, which is made in considerable quantity, but is generally of inferior quality; the best is made in the hills of Sabina, Umbria, and the Marches; 3. wine, of which the greater part is ordinary wine, for home consumption; some better qualities however are made in the Marches, and on the hills of Albano, Orvieto, and Montefiascone; 4. pulse and vegetables of every kind; 5. fruit, including lemons and oranges, which grow in the open fields only in the southern provinces, and chestnuts in the highlands; 6. hemp and flax, especially in the district on the Adriatic; 7. silk is made in the eastern provinces, especially near Passignorone; 8. tobacco is grown also in the eastern provinces near Ancona; 9. timber and fuel for the forest. The Papal State is still well provided with forests of oak, cork trees, elm, sah, and pine; among the pine trees the Pinus pecora is remarkable for its height and elegant appearance. The principal forests are on the sides of the Appennines, on the Mounts Gimino and Albano, on parts of the Mount Lepini, and along the sea-coast of the Mediterranean. The fine pineta, or pine forest, near Ravenna, along the Adriatic shore, has been noticed by Byron, in "Child Harold," canto iv. The horned cattle are remarkably fine, especially in the province of Perugia and the Campagna of Rome, and also in the province of Ferrara. Calendrini reckons the horned cattle at 1,298,000 head. Very good cheese and butter are made, especially in the southern provinces. The sheep are reckoned at two millions. The finest are those of the province of Macerata in the Marches. Much cheese is made of ewes' as well as goats' milk. Pigs are reared in great number, especially in the Campagna. Wild boars are numerous in the Pompine Marshes. The horses are reckoned at half a million, especially in the Campagna. The lakes and rivers abound with fish: the eels of Bolsena and Comacchio are celebrated. Upon the whole the Papal State is very far from being poor and unproductive, as is supposed by most foreigners, and is possessed by its inhabitants of all the commodities of life. The Papal State is one of the most ancient of the states in the world, having been from the remotest times occupied by the Romans, and by the same people, with but few exceptions, down to the present time. Modern History.—The origin and formation of the sovereign state called the Papal State, which is annexed to the See of Rome, is one of the most obscure and intricate subjects in the history of modern Europe. Setting aside the pretended disputed claims of Constantinople, and the fall of the Western empire and the re-conquest of Italy by Belisarius and Narses, Rome and the adjoining territory were administered by an officer called prefect, duke, or patrician, appointed by the Byzantine emperor, and subordinate to the authority of the Roman emperor. This municipal government, had its senate and assemblies of the people, and the bishop of Rome, styled 'Præsiul' in some of the documents of those times, was elected by joint votes of the Senate and the people, but not consecrated until the time was considered the Emperor. The See of Rome enjoyed large revenues and benefices, the gifts of various emperors, besides the gifts and bequests of private persons and the alms of the pilgrims and other pious persons. During the middle ages, it is believed that the Longobards occupied the greater part of Italy, they often threatened but never took Rome, and the people of that city, forsaken as it were by the Eastern emperors, accustomed themselves to look upon their bishop as their chief protector. The spiritual influence and also their personal activity, were the chief means of preserving Rome from being occupied by the Longobards, but they acted generally in concert with the exarchs of Ravenna, at whose court they kept an agent. The exarchs have extended the powers of the representatives of the popes during that period, and the true character of the dominion of the Longobards over the native Italians, have been exhibited with great fairness by Manzoni, in his 'Discorso sopra alcuni Fatti della Storia Longobardesca in Italia,' published at the end of his 'Igiene e le Scrittori.' The persecution of images and image worship by Leo the Isaurian, about a.d. 720, dissolved the loose bond that still attached Rome to the Eastern empire. The Romans and the Italians in general refused to submit to the edict of Leo, and after the emperor was condemned by Pope Gregory II. in the council of Rome, a.d. 726, they refused to pay the usual tribute to the Eastern empire. About the same time a conspiracy was discovered at Rome against the life of Gregory, in which Marinus, duke or imperial lieutenant of Rome, was implicated in concert with the exarch of Ravenna, and the consequence was, that the Romans would no longer acknowledge the authority of Marinus. (Anastasius, Vita Gregorii II., in Muratori's 'Rerum Italic. Scriptores.') The Byzantine writer Theophanes says that the pope countenanced and encouraged this feeling in the people; but Paulus Diaconus (iv. 49) says that 'the people and the troops at Ravenna and in the Venetia resisted, all
of one accord, Leo's edict against the images, and would have proclaimed another emperor, had not Pope Gregory dissuaded him from it.' Meantime Luitprand, king of the Longobards, took from the Byzantines the greater part of the exarchate and the Pentapoleis, which latter corresponds to the district of Arcavsa.

Rome now governed itself as an independent communal wealth, retaining the title of duchy, having its senate, its consuls, and tribunes, and forming alliances with the dukes of Benevento and Spoleto, and with King Luitprand. The pope sued in mediator of all such transactions. As the good understanding between the Longobards and the Romans was not however of long duration, the latter at times resumed an intercourse with the court of Constantinople, and they even applied to Constantine Copronymus to send them assistance: but the Greek emperors being unable or unwilling to exert themselves in defence of Rome, the popes began to think of turning themselves for protection towards the West, where the Frankish monarchy had attained great extent and importance. Gregory III, Zacharias, and Fortunian III. wrote repeatedly to Charles Martel and his successor Pepin in the name of 'the senate and the people of Rome,' who, having renounced their allegiance to the Eastern emperor, wished to place themselves under the helpful protection of the kings of the Franks. Their letters are in the manuscript.

Stephen III., after having crowned, by means of his legate, Pepin, king of the Franks, at Soisson, a.d. 751, conferred upon him the title of Patrician of Rome, which was to be the equivalent of the office which the Byzantine emperor possessed in that city. And when Athosimus, king of the Longobards, devastated the territory of Rome, Stephen wrote to Pepin, in the name of the Church, and of the dukes, counts, tribunes, and people of Rome, to urge him to defend this territory which had been delivered by the Byzantine emperor to that city. Pepin repaired to Italy and, having defeated Athosimus, obliged him not only to respect the duchy of Rome, but to give up the exarchate of Ravenna and the Pentapoleis, not to the Eastern emperor, their former master, but to the king of the Franks and to the Pope of God and of the Roman republic. Such are the words used by the histories of those times, but the text of Pepin's donation is lost. The following list of the towns included in this grant is given by Anastasius:—Ravenna, Rimini, Pesaro, Fano, Cesena, Zoppaglia, Ancona, Fano, Montefeltro, Castel S. Mariano, Bobbio, Urbino, Cagli, Luccella, Gubbio, and Conselmo. Athosimus sent the keys of these towns to be deposited on the altar of St. Peter at Rome, but he did not give up the towns themselves. Moreover, the possession of the towns was purchased by the Roman pope. The popes complained repeatedly in their letters of the nonfulfillment of the act of donation. Desiderius, the successor of Athosimus, at the request of the pope, promised to give up all the towns to the community of Rome if all the towns were to be placed under the administration, not by the Romans, but by the archbishop of Ravenna, who was considered as standing in the place of the former exarch. (Agnellus, Liber Pontificum, in Vita Sergii Archiepiscipi, in Murator, 'Rer. Ital. Script,' vol. i.)

Charlemagne, urged by the entreaties of Adrian I., having come to Italy, defeated Desiderius, and overlooked the kingdom of the Longobards. He assumed the title of Patrician of the Romans, and he is stated to have confirmed his father's donation of the exarchate and Pentapoleis. It is however only in modern times that we find any certain information as to how the pope was deposed; but from that time Rome was administered, not by the Romans, but by the archbishop of Ravenna, who was considered as standing in the place of the former exarch. (Agnellus, Liber Pontificum, in Vita Sergii Archiepiscipi, in Murator, 'Rer. Ital. Script,' vol. i.)

Under the Carlovigian Rome was an imperial city, with its municipal government and its senate; its territory or campagna was occupied by powerful nobles or barons, and the pope himself, in his temporal capacity, was the principal baron at Rome. The other provinces which now form the modern State, such as Spoleto, Viterbo, Castel- rino, Fermo, &c., were in the possession of dukes or counts who were vassals of the crown of Italy. The popes, following the example of the great feudatories of those times, granted part of their extensive domains in subinfeudation to lay lords of the military order, and this seems to have been the origin of the petty principalities of the Romans. In the course of centuries, these subfeudatories, who during the anarchy of the kingdom of Italy, had made other acquisitions of territories and towns, considered themselves and acted as independent princes; until other popes subdued them by force, asserting their right not only over the domains subinfeudated by their predecessors, but over the towns and territories which the various princes had acquired by themselves or had received by grant from the emperor and which they were then put forth in support of their claims the old and never executed donations of Pepin and Charlemagne. This however did not take place till the beginning of the thirteenth century, and only 400 years after Charlemagne. During this long period the popes of the State of Italy, which was the sovereign of the whole country, and whenever he came to Rome he exercised his sovereign rights in that city as in the rest of Italy. But in his absence, the duchy of the exarchate of Rome, which was a separate state, was a powerful country, its government fluctuating between a democracy and the power of the great feudal families. Some of these families influenced the election of the popes, as was the case in the tenth century, when Theodora, her daughter-in-law, married the son of Marozia, were all-powerful at Rome. At last Otho of Saxony came to reassert the imperial authority over Rome and the rest of Italy. [Ottos I.] Otho II., in a diploma which he gave to the republic of Venice at a general diet held at Verona, a.d. 963, exuded the title of King of Italy to the emperor of the Romans. [Ottos II.] Under his successor Otho III., Crescentius, a Roman noble, being appointed consul by the people of Rome, attempted to free that city and its duchy from the dominion of the German emperor, and to replace them under the temporal allegiance of the emperors of the East, who, being distant and weak, would have left the Romans in a state of comparative independence. He however failed, and was beheaded by order of Otho III. John, the son of Crescentius, about 980, restored to the church the whole of the temporal government, with a senate of twelve senators, two consuls, assemblies of the people, and a prefect to administer justice. (Ditmarus, b. v.; Mabillon, Annales Benedicti, ad ann. 984.) The temporal power of the pope was very little, being restrained both by the papal and the imperial power, which retained the ascendancy whenever the emperor visited Rome. But although nearly destitute of temporal power in Rome and the Roman territory, the pope found means through the influence of the papal legates in the several sees of the papal authority of the see of Rome over larger and finer regions. Leo IX. granted to the Norman adventurers who had conquered Apulia, the investiture of that county as a province, in the name of St. Peter, to be held as a fief of the Roman see, which the crowns of Sicily and Naples have continued till within our own times to pay tribute as vassals.

The great contest of Gregory VII. against the emperor Henry IV., which occupied the attention of the whole church over the civil power in general, and to assert at the same time the supremacy of the see of Rome over all other sees. But during this struggle an important addition was made to the temporal claims of the see of Rome by the donation of the duchy of Spoleto by a countess Matilda, who twice made donation of her territories, first to Gregory VII. and afterwards to Pascal II., which last is in her will dated a.d. 1102. But Matilda, as a vassal, could not alienate it.
Rudolph of Habsburg, being elected emperor after a long interregnum, was entirely engrossed by German affairs, and had little time to bestow upon the kingdom of Italy, which Time proved to troublesome appendage of the German crown, and he is said to have been ignorant of the geography of that country. Charles of Anjou, king of Sicily and Naples, was then the most powerful sovereign of Italy, and had extended his authority by various means over the north of Italy, where he had assassinated the title of Imperial Vicar. Rudolph resented this usurpation, and Pope Nicholas III. interfering between the two sovereigns, induced Charles to give up Tuscany and Bologna, as well as the seneship of Rome, which he had also obtained. At the same time he forced Rudolph to define by a special brief the dominions of the holy see, and to separate them for ever from those dependent on the empire, and he sent to Rudolph copies of the donations or charters of former emperors. Rudolph, by letters patent dated May, 1278, recognised the scope of the Città, re-extended others to Ravenna to the Cenano, near the Liris, on the frontiers of Naples, and as including the duchy of Spoleto, the march of Ancona, the exarchate of Ravenna, the county of Bertinoro, Bologna, and some other places. At the same time, Rudolph released the popes from the censures of the Church and gave up the empire giving up all rights over them which might still remain in the imperial crown, and acknowledging the sovereignty of the same to belong to the see of Rome. This charter was confirmed by the electors and princes of the Empire, Rudolph sent the charter to the pope, and Erasmus of Hardulphus's "Annales" for the year 1278. This charter, important as a title, had little effect at the time. Rudolph gave up to the pope a sovereignty which was more nominal than real. Several of the towns, thus ceded, as Bologna, Perugia, Ancona, had long been rebellious, and they were possessed of considerable territories; while others, such as Montefeltro and Bertinoro, constituted hereditary principalities, and the transfer of allegiance from the Empire to the Holy see was Accordingly, we find during that period a number of petty princes and tyrants settled in central Italy often at war with each other. The towns had revolted, and the people of the conti of Milan. The distant popes from Avignon sent legates with some mercenary troops to support the Guelf party, and to assert the authority of the papal see, but the towns and lords of Romagna stood their ground and defied them. The pope, moved with eloquence and enthusiasm, a friend of Petrarch, put himself at the head of a popular movement, drove away the Colonna and other turbulent nobles, and proclaimed the republic, of which he was named tribune by popular consent. He led a campaign against the barons, and at last the pope sent a legate to supersede him. After seven months' power Cola di Rienzo was obliged to run away from Rome, at the beginning of 1348, and, being arrested, was taken prisoner in 1349, and on June 7th, some time after, having resolved to make a strong effort to reconquer the States of the Church, fixed upon Cardinal Gisbert of Albornoz, a Spanish noble, who had already distinguished himself in the wars of Spain against the Saracens, and was considered as a great friend of Cola di Rienzo, whom the cardinal had sent to Rome to second his views, was murdered there in a popular tumult, in October, 1354. [ALBORNIZ, GIL DE].

The papes returned to fix their court at Rome in 1371, and the government of the Papal State then assumed a more
regular form, occasionally interrupted however by insurrection of the people of Rome. [EUGENIUS IV.] A great part of the territory, especially north of the Apennines, continued in the hands of petty princes or tyrants. Alexander VI., in the year 1500, sent his son Cesare Borgia, who both by skill and ability quickly attained the esteem of the Magistrates. [The Battle of Cerbara.] Julius II., the successor of Alexander VI., put himself at the head of an army, conquered Romagna, Bologna, and Perugia, and from that time the Papal State acquired its present compact form. Ferrara was annexed to it in 1597 [Ferr., House of Este.] in which year his duchy of Florence in 1622, after the death of the last duke Della Rovere without issue, and in 1650 the duchy of Castro and Ronceglinone. [FARNERSE.] In 1797, Bonaparte detached the four legations or provinces of Bologna, Ferrara, Ravenna, and Forlì, and annexed them to the Napoleonic empire. Napoleon detached the Marches, which he annexed to his kingdom of Italy, and in 1801 he restored the provinces of the Papal State, and annexed it to the French empire. In 1814 the pope was restored to his dominions. [Pius VII.]

The history of the Papal State, as connected with that of the rest of Italy, may be traced in Guicciardini, Muratori, Greece, and modern history. The Papal States, besides the territories of Italy. Muratori, in his ‘Piena Esposizione dei Diritti Imperiali ed Estensi su Comacchio,’ has treated of the controversy concerning the various donations alleged to have been made to the Roman see. Cardinal Oriani has published the documents relating to the donation of the Istria and the papal States over the Stati loro Temporali,’ Rome, 1754. See also ‘De la Puissance Temporelle des Papes,’ Paris, 1813; and on the opposite side, in favour of the papal see, see De Maistre, ‘La Question des Eglises.’

PAPASQUA’RO. [MEXICAN STATES.]

PAPAVER, the name of a genus of plants of the natural family of Papaveraceae, of which one of the species is celebrated for yielding Opium. The history of this, like that of many other cultivated plants, is little known, as it is supposed to have been cultivated for the sake of its insipid juice, though it was well known to the Greeks, and cultivated at early periods on account of its seeds. (Theop., lib. x., cap. xii., ed. Bodinus and Stapel, p. 189.) Some botanists are of opinion that it is the *papaver* or *Mesocordes*; and that the kind with black seeds was called *dyson*; and that with white seeds *mesocordium*; and that it is the juice of this plant which Hippocrates recommends under the name of *psyke mesocordium*, or juice of the poppy. Pliny (xx, c. 14) calls it *mesocordium* or *papaver.* Sprengel, in his ‘Hist. Rer. Herb.,’ vol. i., p. 176, quotes Dioscorides, lib. iv., c. 65, as referring to *Papaver somniferum,* and to *P. Rhoeas,* but in his edition of that author (ii., p. 380) he mentions only the latter plant; hence we may infer that the former is referred to in the unknown work of Dioscorides nowhere else mentions it. We do not in this instance get the same degree of assistance as in many others from Arab authors. Opium is described by them under the name of *aqeeqon,* while *apapurnum* is quoted by Dr. Ainslie as its Sanscrit synonym. The popular plant is described by the Arabs under the name of *Khuskhush,* while the Sanscrit is *chooa,* and the Persian and Hindostan, *post.* The species of Papaver are chiefly found in European countries; but a few species extend to the Caucasus and Armenia, and one species grows in the deserts in the western part of the Euphrates. They were in the earliest notice of the opium poppy. This species is now common in most parts of Europe, but having been so long cultivated, it may appear indigenous in many countries where it has only escaped from cultivation. It is, as is well known, extensively cultivated in India, but it can nowhere be seen in a wild state, as the climate is too hot to support it except for a few months in the year. The genus Papaver has two convex deciduous sepals. Petals four. Styles four. Stamens four to twenty, radiating and sessile upon a disk which crowns the flower. Capsule obovate, one-celled, opening under the crown of the stigmas with short valves. Pericarp intercalary, incomplete. Flower stalks infixed at the base of the flowers have expanded. The species of are large and showy, but last short time. Herbaceous plants abounding in milky juice. The species are twenty-five in number, but few are remarkable for any useful properties. The English species are distinguished as having a rough and a smooth capsule; of the former, *P. hybridum* has an obrate globose capsule, and *P. argemone,* an elongated club-shaped capsule; of those with smooth capsules, *P. Rhoeas* and *P. dubium,* the former banded and mottled, the latter white or yellow. *Papaver somniferum,* or the white poppy, is a native probably of Asia Minor, or of some part of the Persian region of botanists, but having being so long cultivated, it is found wild in many parts of Europe. The species is distinguished from its oburate or globose capsule of smooth as well as the calyx, the stem smooth and glabrous, leaves emerging the stem incised and repand, with subulate teeth. There are two distinct varieties, which by some botanists are considered to be distinct species: the dark, the red-flowered, and the white-flowered, of which the latter is the most common, with white or yellow flowers, white-flowered with white seeds, *P. officinale.* The latter is characterized as having an ovate globose capsule, fornix under the stigmas either none or obliterated; peduncles solitary. The former (*P. somniferum*) has globose capsules, fornix under the stigmas, and obliterated peduncles, many. The flowers are usually red of different tones, though sometimes white. Dr. Royle states that he has seen only the white-flowered variety in the plains of India, and the red-flowered in the Himalayas, and both cultivated extensively in the latter. The poppy is cultivated in many parts of Europe on account of its seeds, which yield a bland oil much esteemed in France; and in this country chiefly on account of the capsules, which are used medicinally. It is extensively cultivated in many parts of India, on account of its insipid juice, so well known as opium, though this is occasionally prepared also in Europe. The cultivation of the poppy is very simple, though the watering requires care, and the plants must not be crowded too much together. They are easily transplanted, the watering being more copious as the period of flowering approaches, and until the capsules are half grown.

In India the cultivation takes place in the cold weather, that is, during the winter months. The *Papaver somniferum* is cultivated very soon after the flowers fall, as the capsules rapidly enlarge. The people go into the fields after sunset with small knives, usually with four crooked blades, with which they make either longitudinal or transverse incisions, and form them in the stems, to scrape off the juice which may have exuded, generally about one grain from each quadruple incision. But the quantity varies according to the soil, the cultivation, and the due management of the irrigation, as well as the quantity of dew deposited. When the poppy is of the kind which yields a bitter juice, the scarifications dry up, and little opium is exuded. When the dew is copious, it washes out the wounds in the capsule, and thus facilitates the running off of the milky juice. When the dew is moderate, the milk thickens in irregular drops, which adhere together, and dry in this state, forming the grain of opium. But in India the whole of the day’s collection is rubbed together in a mortar or similar vessel, for the purpose of breaking down the grain so as to reduce the whole to a homogenous form suitably milled, when it should be dried as quickly as possible in the shade, and turned over very frequently.

Samples of all the opium brought for sale to the East India Company’s opium factories are submitted to a steam drying process, which is considered by the company as the most ascertained, and found often to amount to 30 per cent. These two methods of drying opium explain the accounts of different writers and travellers. Gubourg finds that Dioscorides, Kämpfer, and M. Tisserat describe the opium as being pounded and moulded together, while Oliver and Belon describe it as being simply dried. The latter indeed describes opium as formed by the assagagement of the small seeds gathered on the capsules. These two modes of preparation were introduced in connection with the opiums of commerce.

PAPAVER. OPium. Madonna Properties. — The juice of the unripe capsule or fruit of the *Papaver somniferum* seems to have been used on account of its narcotic powers from a very early period, first in the East, of which it is native, and afterwards in the West. As it is mentioned by the authors of the *P. somniferum,* called *P. S. album,* in which the seeds are white, and the openings under the stigmata obliterated, and *P. S. migrum,* in which
The seeds are blackish-grey, and the openings under the stigmata perfect; some differences are found in the relative proportion of the chemical constituents of the opium procured from them; but the P. S. album (Papaver officinale, Gmelin) is the kind chiefly cultivated in Persia and India.

The latest sophistication which the juice receives is that performed by the peasants who collect it, and who lightly scrape the epidermis from the shell to augment the weight. This operation adds about one-twelfth of foreign matters. Thus collected, opium has the form of a glutinous and granular jelly. It is inebriated and cooks at the bottom of salivas. On inquiring why water was not employed in the place of salivas, the answer was, that water caused it to spoil. It is afterwards enveloped in dry leaves, and in this state is sold. The seeds of those poppies which have yielded opium equal are gathered and stored the following year. Such is the custom of M. Ch. Tarent, of the place of Paris.

In India the juice is mixed with oil obtained from the seed of the poppy, to hinder the rapid drying of the juice. The produce of the first incisions is of a light yellow colour; the others are fainter in odour and darker coloured. In general all three gatherings are mixed together, and sent to market in small baskets. The quantity obtained varies not only with the soil and mode of cultivation, but also with the season and the time of collecting. In wet gloomy seasons not only is the juice not kept, but it becomes much less, and the proportion of morphine is also less. The quantity of morphine depends likewise very much on the time of gathering; if the harvest be postponed till the capsules begin to turn white and hard, it is greatly deficient; and by the time the capsules have dried to dust, it has entirely disappeared. It is not, as in the case of many other vegetable alkaloids, transferred to the seeds, as they are altogether devoid of any narcotic principle, the oil which is obtained from them being bland and wholesome, and abundantly used as food; even the seeds themselves do not retain it, being eaten by birds, to which they are given (from the black variety), under the name of maw-seeds.

Several varieties of opium are met with in commerce, which may be noticed here in the order of their reputed excellence. The combined quantity of morphine contained in each being assumed as the criterion.

1. Smyrna or Levant opium, which Mr. Pereira considers insynonym with Turkey opium; though German pharmacologists deem Turkey and Egyptian opium to be synonymously the same. The Smyrna opium is larger and roundish or flattened masses of various sizes, rarely exceeding two pounds in weight, enveloped in leaves, and surrounded with the reddish triangular capsules of several species of Rumex, such as R. orientalis, R. Patentia (which are frequently used in gargles), the inner bark and pith of which is soft, while the opium is soft. When first imported, the masses are soft, and of a reddish-brown colour; but by keeping they become hard and blackish; and on this account it is termed by the French opium noir. Its consistence is soft, at least of the interior; even when the exterior is very hard. Its lustre is waxy; the taste bitter, acrid, and persistent.

2. Constantinople opium. Of this there are two sorts: one in large irregular cakes, which are flattened, like the Smyrna opium, and of very good quality; the other is in small flattened regular cakes of a rectangular form, from 1/2 to 2 inches in diameter, and covered with a poppy-leaf, the mids of which divides the disk into two parts. It has an odour similar to the preceding kind, but more feeble; at first it is reddish both without and within, hence called by the French l'Opium Russe; it is very black and dries in the air, but never becomes so hard as Smyrna or Egyptian opium, than which it is more mucilaginous. Th. Martius is of opinion that it is a manufactured article, prepared at Constantinople, out of Smyrna opium, by the addition of gum. It is one of the German but rarely of English commerce. It is never covered with the Rumex capsules as the Smyrna opium.

3. Egyptian or Alexandrian opium 'occurs in round flat cakes of about three inches in diameter, covered externally with a poppy-leaf, and not too multilated a state to be determined. It is distinguished from the preceding varieties by its reddish colour, analogous to soocotrine or hepatic aloe, which does not by time or exposure to the air become darker; the odour is fainter and somewhat mousy. Though the cakes are of all the sorts much the hardest, so that a blow with a hammer will cause one to split into fragments, yet by exposure to the air it becomes soft.

4. 'Trebizond or Persian opium occurs in the form of cylindrical sticks, which by pressure have become somewhat angular. Their length is about six inches, their diameter about six inches. Each one is enveloped in a smooth shineny leaf, and tied with a string; this is similar to that of soocotrine aloe. It possesses a stronger odour than the Egyptian kind, but fainter than that of Smyrna, united with a musty one. The taste is intensely bitter. ['Corium.']

5. Indian opium, of which there are several varieties as already described. [Opium Trade.]

6. English opium is in flat cakes, enveloped in leaves. It resembles the Egyptian more than any other kind; its colour is that of hepatic aloe, with a moderately strong heptaceous odour.

Before offering a summary of the points of difference, in chemical composition and other respects, of these various sorts, it is necessary to enumerate the general constituents of opium:—1. morphia; 2. codes; 3. paramorpha or tetranthe; 4. paralbe; 5. marceine; 7. meconine; 8. morcinic acid; 9. an oily acid; 10. gum; 11. resin; 12. extractive; 13. a fixed oil; 14. caschouche; 15. an odorous principle; 16. ligneous matter; 17. inorganic salts, such as sulphate of lime and potash, &c. There are also the various pharmacological and intestinal impurities, such as sand, of which even the best Smyrna opium contains a large portion; 10 ounces of opium frequently containing 10 drachms of stones and gravel. In the interior of the cakes leaden bullets are often discovered. The cakes should always be cut through the centre in order to detect this fraud.

The relative proportion of these numerous ingredients varies very much, not only in the samples from different countries, but in the same sort. Thus Smyrna opium, though the average quantity of morphine which it yields may be stated to be 10 per cent, in five specimens examined by Mulder gave 10 per cent. in the best, and little more than 2 in the worst.

The professor Guibort notes Constantinople opium to yield only half the quantity of morphine procurable from Smyrna opium; while Mr. Duncan of Edinburgh has obtained even 14 per cent. Guibart also affirms that Egyptian opium yields only 5-7ths of the morphine obtainable from Smyrna opium, while Dr. C. Christian obtained 16 per cent. from it. Of the Indian kinds Dr. Smyttan procured only 3 or 5 per cent. of morphia; while Dr. C. Christian obtained 9/4 from the Malwa opium: and from Bengal opium Dr. Smyttan obtained 3 or 3½ per cent.; while Mr. [1] Dr. C. Christian obtained 9/4 from the same.

From English opium 3 per cent. may be obtained. From German opium Blitz procured 16½ to 20 per cent.; from some French opium Petit obtained 16 to 18 per cent., and Caventou the large amount of 22 to 28 per cent.

The extreme discrepancy of these results may be explained not merely by the varying seasons when the specimens were produced, and the different degrees of skill and dexterity in the chemists, but by the fact that the morphia is more easily and effectually separated when the opium is fresh; hence the price of opium at the beginning of the season is very high, while that of opium at the end of the season is very low. It is always proper to institute an examination into each new purchase of opium, to ascertain the presence and amount of morphia. Some specimens of opium, with to the eye present all the physical characters of Smyrna opium, give only 2 per cent. Smyrna opium, while others of those described hitherto inimitable, such as the transparent agglutinated tears seen on cutting it across, are found on analysis devoid of the smallest trace of morphia. (Journal de Pharmacie, tom. xxiv., pp. 325, 446.)

From the above it appears that a solution of 100 grains, macerated 24 hours in two fluid ounces of water, filtered and strongly squeezed in a cloth, if precipitated by cold solution of half an ounce of carbonate of soda in two waters,
Tubular View of the Principal Characters of the Crystalline Principles of Opium.

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<td>Taste</td>
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<td>Rather aerial</td>
<td>Slightly bitter and metallic</td>
<td>Rather aerial and metallic</td>
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<td>Fuses at</td>
<td>Above 240°</td>
<td>30°, or in boiling water</td>
<td>Insoluble in 80 pts.</td>
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<td>30°, or in boiling water</td>
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<td>In cold water</td>
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<td>In cold alcohol</td>
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<td>In cold ether</td>
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<td>In caustic alkalies</td>
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<td>Nitrogen of the crystals</td>
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<td>Atoms of copper</td>
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<td>Action on vegetable alkalies</td>
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It must be obvious that a substance so complicated a nature cannot act uniformly on organised beings, even supposing them to be always constituted alike, which never is the case, and which circumstance is very important to age, constitutions of habits, life, states of disease, and idiocy, &c. Some of the effects which follow the employment of opium have been attributed to one principle and some to another, but, with a few exceptions, nothing positive has been ascertained: moisture, the climate, or other agencies, act on all as poisons, but with somewhat different effects according to their organization. In other mammals, two kinds of effects are seen for the most part; the one of irritation, the other of diminished nervous power, symptoms of congestion being altogether wanting or very slight. This difference of effect corresponds with a difference in the development of the brain. In the invertebrate animals, no symptoms of irritation seem to be caused by opium. This poison in them acts only on the contractile tissues, and produces symptoms of weakness or loss of contractile power.

In the animal kingdom, the action of opium varies with the degree of development of the nervous system; and in the lowest orders the effects are quite analogous to those observed in vegetables. (Periera.)

Abridgment. It has been the object of the present paper to give a true and unbiased view of the effects of opium on vegetation, and to show that the same effects can be produced in animals by the use of opium, and that the action of opium is not confined to the vegetable kingdom. The effects of opium are well known, and have been studied by many of the best authors. It is not necessary, therefore, to go into detail, but to say that the effects are the same in animals as in vegetation, and that they are produced by the same causes. The effects of opium are not confined to the vegetable kingdom, but are produced in animals by the use of opium, and that the action of opium is not confined to the vegetable kingdom. The effects of opium are well known, and have been studied by many of the best authors. It is not necessary, therefore, to go into detail, but to say that the effects are the same in animals as in vegetation, and that they are produced by the same causes.
from a quarter of a gram to one grain, opium generally acts as a stimulant, though in this respect the symptoms are not uniform. Usually the vascular system is somewhat excited, and a sensation of fulness is experienced about the heart. The excitement in the cutaneous vascular system is accompanied by alterations in the condition of the nervous functions. The mind is exhilarated, the ideas flow more quickly, a pleasurable or comfortable condition of the whole system is experienced, which is difficult to describe; there is a capability of more rapid and saner use of the symphonies stored. This is followed by a diminution of muscular power, and of susceptibility to the impression of external objects; a desire of repose is experienced, with a tendency to sleep. While these effects are taking place, the digestive organs become dry, and hunger and nausea or vomiting is induced. The symptoms of excitement soon pass away, and a state of torpor succeeds; the individual feels indisposed to exertion, the muscular system appears enfeebled, the force of impressions on the organs of the senses is diminished, and the personal appearance is frequently that of sickness. This state is followed by an almost irresistible desire to sleep, which is frequently attended by dreams, sometimes of a pleasing, at others of a frightful nature.

3. Third Degree of Operation: Poisons Effects of Opium, as given by Dr. Christie.—The symptoms of poisoning with opium, when it is administered at once in a dangerous dose, begin with giddiness and stupor, generally without any previous stimulus. The stupor rapidly increasing, the person becomes motionless and insensible to external impression; he breathes very slowly, generally lies quite still, with the eyes shut and the pupils contracted; and the whole body is still. The action of the heart commonly ends in twenty-four or thirty-six hours, and is followed by nausea, vomiting, giddiness, and loathing of food.

The quantity which can produce a fatal effect in a person unaccustomed to its use is very small, even four grains; and in children, owing to the large quantity of blood which naturally goes to the brain, and the great impressibility of their nervous system, a very minute portion of opium, or of its numerous preparations, open or disguised, can produce death. These facts constitute a strong reason for using opium with caution, for the safety of those who are at all in the habit of taking it, and also for avoiding in this place all details connected with its medical use. It is undoubtedly one of the most important means of alleviating human suffering, when appropriately administered, and yet one of the greatest enemies of mankind when abused. It is by the self-doctoring in general that the practice of opium-eating is acquired; and it is the more necessary to warn such persons against commencing the use of it, even for the legitimate purpose of overcoming disease, as they may in many cases be induced by some mental or bodily misery, which their previous indulgence has entailed upon them. Of these facts, the account of opium-eating among the Turks, as detailed by Dr. Oppenheim, are confirmatory.

Turkish opium-eaters: Theriaki.—The causes leading to the use of opium are many, and among them may be reckoned the following: long-continued diarrhoea, as a remedy for which opium is used in the first instance, and its use afterwards continued as a habit; chronic coughs, in which opium is used as a popular medicine; habitual drunkards also frequently have recourse to opium as a new stimulus, after they have abused wine in some fit of repentance. Persons holding high offices or dignities in the state have also recourse to opium, when the preservation of their character forbids the use of wine: some very strict believers also take opium as a restorative in cases of great exertion, as the Tartars (couriers), who travel with immense and celer.

Opium-eaters generally begin with doses of from half a grain to two grains, and gradually increase the quantity till it amounts to two drachms and sometimes more a day; they usually take the opium in pills, but avoid drinking any water after having swallowed them as this is said to produce violent cholera; to make it more palatable it is sometimes mixed with syrups or thickened juices; but in this form it is less intoxicating, and resembles mead; it is then taken with a spoon, or dried in small cakes, with the words "Mush Allah" (the work of God) imprinted on them.

The effect of the opium manifests itself one or two hours after it has been taken, and lasts for four or six hours, according to the dose taken and the idiosyncrasy of the subject. In some persons accustomed to take it, it produces a high degree of animation, which the Theriaki represent as the scene of happiness.

The habitual opium-eater is instantly recognised by his appearance. A total attenuation of body, a withered yellowish skin, a red and swollen countenance, and large virtues, a loading of the bowels, having frequently to such a degree as to assume a circular form, and glossy deep-sunken eyes, betray him at the first glance. The digestive organs are in the highest degree disturbed; the sufferer eats scarcely anything, and has hardly one evacuation in a week; his mental and bodily powers are destroyed,—he is impotent. By degrees, as the habit becomes more confirmed, his strength continues decreasing, the craving for the stimulus becomes even greater, and to produce the desired effect, the dose must constantly be augmented.

When the dose of two or three drachms a day no longer produces the beatific intoxication so eagerly sought by the Opiophagi, they mix the opium with corrosive sublimate, increasing the quantity till it reaches ten grains a day; it then acts as a stimulant or a sedative, according to the perfect repose. As the poisoning advances, the features become ghastly, the pulse feeble and imperceptible, the muscles exceedingly relaxed, and, unless assistance is speedily procured, death ensues. If the person recovers, the vivacity of the mouth of the individual is far more than his former vitality, since he has got rid of most dreadful tortures, as during the whole of that month they are not allowed to take anything during the day. It is said that to assuage their sufferings, they swallow, before the morning prayer, besides the usual dose, a certain number of other doses, each wrapped up in its yellow paper, having previously calculated the time when each envelope shall be unfolded, and allow the pill to produce the effects of their usual allowance. When this beneficent habit has become confirmed, it is allowed to the opium-eater, when deprived of this stimulant, as he is as dreadful as his bliss is complete when he has taken it; to him night brings the torments of hell, day the bliss of paradise. Those who do not take the attempt to discontinue the habit, usually mix it with wax, and daily diminish the quantity of the opium, till the pill at last contains nothing but wax.—(Dr. Oppenheim's State of Medicine in Turkey; British and Foreign Medical Review, October, 1857, p. 74.)

Coleridge.—For ten years the anguish of my spirit has been indescribable, the sense of my danger staring, but the consciousness of my guilt worse, far worse than all.

I have prayed, with drops of agony on my brow; trembling, not only from fear, but from justice of my Maker, but even before the mercy of my Redeemer.

I gave thee so many talents—what hast thou done with

* Hence the same sometimes applied to such persons, 'Sulayma'na yarwin 'swallower of sublimates,' Notes to 'Chi'la Harold,' Canto III, Note 3[1].
them?" Secondly, overwhelmed as I am with a sense of my direful infirmity, I have never attempted to disguise or conceal the cause.

'On the contrary, not only to friends have I stated the whole case with tears and the very bitterness of shame, but in the instance I have given, men, women, and acquaintances, who had spoken of having taken laudanum, of the direful consequences, by an awful exposition of its tremendous effects on myself. Thirdly, though before God I cannot lift up my eyelids, and only do despise of his mercy, because the sinner would be adding sin to crime; yet to my fellow-men I may say that I was seduced into the accursed habit ignorantly. I had been almost bedridden for many months with swellings in my knees. In a medical journal, I unhappily met with an account of a cure performed in a far case of this habit, that appeared to me so, by rubbing in of laudanum at the same time taking a given dose internally. It acted like a charm, like a miracle! I recovered the use of my limbs, of my appetite, of my spirits—and this continued for near a fortnight. At length the moral faculties and the body—tired as it was—were by the supposed remedy was recurred to:—but I cannot go through the dreary history. Suffice it to say, that effects were produced, which acted on me by terror and cowardice, fear, and daily health, not (so help me God) by any temptation of pleasure, or expedition or desire of exciting pleasurable sensations.

'On the very contrary, Mrs. Morgan and her sister will bear witness so far as to say, that the longer I abstained, the more I felt the desire, the keener the desire; and till the moment, the direful moment arrived, when my pulse began to fluctuate, my heart to palpitate, and such a dreadful falling abroad, as it were, of my whole frame, such intolerable restlessness and incipient bewilderment, that in the last of my several attempts to abandon the dire poison, I exclaimed in agony, which I now repeat in seriousness and solemnity, 'I am too poor to hazard this.'

'Had I but a few hundred pounds, but 200£, half to send to Mrs. Coleridge, and half to place myself in a private masquerade procuring what was wanted; but when a physician thought proper, and where a medical attendant could be constantly with me for two or three months (in less than that time life or death would be determined), then there might be hope. Now there is none! O God! how willing would I place myself under Dr. Fox, in his establishment; for my case is a species of madness, only that it is a derangement, an utter impotence of the volition, and not of the intellectual faculties. You bid me remorse myself! Go, bid a man paralytic in both arms, to rub them briskly together, and that will cure him. 'Alas!' he would reply, 'that I cannot move my arms, is my complaint and my misery.'

'De Quincy required the exhilaration of 8000 drops (about 8 tea-spoonfuls), or 220 grains a day, to support the convulsions of opium. It is necessary to place these facts before the public, particularly as there is reason to believe that the practice of taking opium is becoming common in this country, where other stimulants are relinquished. Besides the injury done to the body in two and a half cases, it is a great inconvenience, as well as sometimes of danger. The great variation in the strength of the tincture of opium, as found in the shops, has been pointed out by Dr. Christian (Edin. Medical and Surgical Journal, vol. xiv., p. 329), and even breaking, or 'purchasing, the strength of the drug, which as generally prepared is a feeble preparation, but in other instances so powerful as to prove, in the dote of a few drops, fatal to children. (See 'Retumns from the Corners of England and Wales, of all Inquisitions held by them during the last two and other subroutine practices, the most frequent ingredient in which is opium. Paregoric elixir, though a weaker preparation than tincture of opium alone, or laudanum, differs much in strength in the two kingdoms. Scotch paregoric elixir is only one-fifth of the strength of laudanum, while English paregoric elixir is four times weaker. Some secret preparations in extensive use are, on the other hand, considerably stronger, such as the black drop, Batley's sedative liquor, and Jerome's sedative solution, which last is much employed in India, and even beyond the British isles, and which is not only more effective but cheaper. The effects so inconveniences that to avoid them the alcaloids of opium have been substituted for the crude drug. Thus acetate and hydrochloride of morphia often agree better with the system, where opium is unsuitable; and a syrup of codeine is efficacious against the gastric disorders of tropical climates, where opium or morphia even cannot be borne. (Journal de Pharmacie, tom. xxiii., p. 418; et tom. xxiv., p. 144.)

'Some of the effects of the white poppy are ordered to be used to form an extract, and a decoction which is employed as a sedative. These should be collected before they become ripe, as all the morphia is dissipated afterwards. The petals of the wild field poppy, P. rhoes, are used to form a syrup, which is only esteemed as a colouring material, and is not narcotic. (Sachs, De l'Action des Cohen de l'Empire, 1836; Charret, De l'Action des Cohen de l'Empire; On Poisons;
PAPAYA. [CARICA.]
PAPAYA: the principal species, of which a full account has already been given [CARICA], are a very small natural order of Exogenous plants, consisting of the genus Carica alone, and apparently allied to Cucurbitaceae and Passifloraceae, with the former of which it corresponds in its gourd-like fruit, with parietal placenta, and in its disunited sexes; while it approaches the latter also in placentaion, in its superior succulent fruit, and in the structure of its seeds. The order is remarkable in its fructification for having monopetalous male flowers and polyptelous females, and in its vegetation for its simple unbranched stems, growing only by the gradual development of a terminal bud. For a full account of the Papaw tree itself the reader is referred to CARICA.

CARICA PAPAYA.

1, a monopetalous male flower; 2, a polyptelous female flower; 3, a transverse section of the ovary; 4, a longitudinal section of a seed.

PAPENBURG is a flourishing town in the lordship of Meppen and the province of Osnabrück, in 53° 33' N. lat. and 7° 25' E. long. Towards the end of the seventeenth century a few Germans formed a small settlement on the neighbouring moors for the purpose of digging and selling peat, which by degrees has become a place of great trade. A canal seven miles in length, connected with several others, runs through the Grotere Sybi (which is the harbour of the Papenburg ships) into the Elbe. The town contains two Roman Catholic churches, three schools, and between 400 and 500 houses. The inhabitants, 3600 in number, gain their livelihood chiefly by ship-building and navigation; they build annually about 60 ships for East Friesland, as well as for their own use, and have one hundred ships of their own, from eighty to ninety tons burden, manned with 5 or 7 men, each of which, when first launched and equipped for sea, is worth £1000 or £1200 Dutch florins. During the French revolution several hundred ships sailed under the neutral flag of Papenburg. Besides saw-mills, sail-cloth, and rope manufactories, there are some brandy distilleries and lime-kils: the quantity of pest annually dug on the moors is very great, and it forms an important article of export to the ports of the Baltic and the German Ocean.

PAPER. In early times the materials used for writing upon were chiefly such as only required some little mechanical fashioning to fit them for that purpose. Characters were engraved on flat stones, made smooth, or were impressed in clay, which was afterwards dried and hardened by sun or fire, as in the Babylonian bricks. Thin boards of wood covered with wax or some similar composition, and plates of ivory and of metal, have been used; but a more convenient material was afforded by the leaves of some species of trees. The skins and liniments of animals have also been made fit for writing upon; but wherever the Egyptian papyrus was introduced, all these things fell into disuse, except parchment, which is still preferred for certain purposes. [PARCHMENT; PAPYRUS.]

The art of making paper from fibrous matter reduced to a pulp in water appears to have been first discovered by the
Chinese about the year 95 A.D. In the time of Confucius they wrote with a style, or bodkin, on the inner bark of the bamboo. The Chinese paper has been supposed to be made of silk, but this is a mistake; silk by itself cannot be reduced to a pulp suitable for making paper. Refuse silk is indeed occasionally used with other things, but the greatest part of the Chinese paper is made from the inner bark of the bamboo and some other trees, but chiefly from the bamboo. The Chinese also make paper from coarse cotton and linen rags, and a coarse yellow sort for wrappers is made from rice-straw. Only the second skin of the bark of the bamboo is used, which is beaten into a pulp with water. The spinning is performed on the sheets of the cellophane, on which the pulp is made into paper being sometimes ten or twelve feet long, and very wide, and managed by means of pulleys. It is formed of fine threads of bamboo, as ours are of wire. To prevent the ink from running, the sheets are dried into little cakes and the ink is sold to artists, which is usually more costly than ours, is generally sufficient for the purpose, but sometimes fish-gluue is mixed with the solution of alum. (Du Halde's Chineas, vol. ii. p. 415; Davis's Chinese, chap. xvii.) Before the invention of paper the popusus was in general use among European nations, but when the Saracens conquered Egypt in the seventh century, it could no longer be procured, and parchment became so dear that the writing of antient manuscripts was erased to allow of their being re-written upon. [Palmleaf Manuscripts] The growth of paper in the seventh century was that a person should have to have either discovered, or to have learned from the Chinese, the art of making paper from cotton; for it is known that a manufactory of such paper was established at Samarcand and Constantinople in the sixth or seventh century A.D. The Arabians seem to have carried the art to Spain, and to have there made paper from linen and hemp as well as from cotton. (Journal of Education, No. 10.)

A person of the name of Tate is said to have had a papermill at Marford in the sixteenth century; and another is stated to have been established in 1588 at Dartford in Kent, by a German, who was knighted by queen Elizabeth. Previously to this, and for some time afterwards, our principal supplies were from France and Holland. The making of paper was first carried on in England, even as early as 1662. Fuller has the following remarks respecting the paper of his time:—‘Paper participates in some sort of the character of the country which makes it; the Venetian being neat, subtle, and court-like; the French, light, slight, and slender; and the Dutch, thick, corpulent, and gross, sucking up the ink with the sponginess thereof.’ He complains that the making of paper was not sufficiently encouraged, ‘considering the vast sums of money expended in our land for paper out of Italy, France, and Germany, where they are made at a third the cost of that in England.’

Thomas Watson, a stationer, by the introduction of foreign improvements in 1713, gave a great impulse to the manufacture of paper. Still, notwithstanding the great increase in the demand and application of capital, it was much retarded by the duty of 14s. 3d. per hundredweight on the pulp, and printing papers, accompanied with vexatious Excise regulations; and it was not till the reduction of the duty to 14s. per pound on all kinds that the manufacture could be said to be allowed fair. In the making of paper any fibrous vegetable substance may be used, as the inner bark of trees, the stalks of the nettles, the tendrils of the vine, the bine of the hop, and even wheat-straw, upon paper made from which a book is published. What silk by itself can do the above-mentioned answer well enough, but the making is too expensive. Nothing however has yet been found to answer so well as linen, hempem, or cotton rags. The sweepings of the cotton-mills are also much used. Woolen cloth is not fit for paper pulp, and must be reduced to a pulp by maceration into a suitable pulp, and gives a hairy texture to the surface.

In all kinds of paper-making, whether from the bark of trees or other fibrous matter, or from rags, the general process is the same. The fibrous material is cut and bruised in water till it is separated into fine and short filaments, and becomes a sort of pulp. This pulp is taken up in a thin and even layer upon a mould of wire cloth, or something similar, which allows the water to drain off, but retains the fibrous matter, the filaments of which are, by the process of reduction, dried by pressing, and pressed together; or woven or felted together that they cannot be separated without tearing, and thus form paper.

The rags of our own country do not constitute a fourth part of the quantity which we use in making paper. Italy and Germany furnish the principal supply, and if they were imported in bags of about 4 cwt., each bag being marked in such a manner as to indicate the quality of the rags which it contains.

In every paper-mill the first business is to sort the rags into small pieces. This is done by women, each of whom is provided with a large knife to cut the rags. Threads and seams are carefully put by themselves: if ground with the cloth, they would form specks in the paper. The rags, when cut, are thrown in to five or six different troughs, according to the quality of paper to be made. Only the finest linen rags are used for the best writing-paper, but cotton as well as linen rags are now used for printing-paper. A good workwoman can sort and cut about a hundredweight a day. Hempen rags are used for coarse and German furnish the principal supply, and if they were imported in bags of about 4 cwt., each bag being marked in such a manner as to indicate the quality of the rags which it contains.

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close upon the mould, and is required to retain the stuff on the mould and to limit the size of the sheet.

The dipper, or vatsman, inclining the mould a little towards him, dips it into the vat with the deckle upon it, and lifts it up again towards himself. He shakes it so as to distribute the stuff equally, and the water drains through the wire. He lays the mould on the edge of the vat, and takes off the deckle, which he requires to apply to another mould. After

remaining two or three seconds to drain, the mould is taken by another workman, the coucher, who, having deposited the sheet of paper upon a felt, or piece of woolen cloth, returns the mould to the dipper, who in the meantime has made another sheet, which stands on the vat ready to be couched upon another felt spread over the former sheet. This is repeated until two or three moulds are made, a pile of sheets called a post, consisting of six or eight quires. This post, with its felts, is placed in the vat press, and subjected to a strong pressure to force out the superfluous water, and to give firmness and solidity to the paper. The pile is then removed, while the vats press, the felts taken out, and the sheets are pressed again by themselves. They are then taken from the press, and hung up five or six together, in the drying-room.

Presses are now made, and only requires finishing, but the greater number of the finishing processes are only required for writing-paper, common printing-paper and wrapping-paper being ready for packing up when dried.

Writing-paper is dipped, five or six sheets together, into a vat of size, and afterwards pressed to force out the superfluity. It is then taken to the drying-room, and dried in the press. Printing-paper is sized in the stuff. Every sheet is now examined, imperfections removed, and bad sheets taken out. A large pile of paper is then made, and pressed with great force to remove the sheets quicker. The pile is then taken down to the sheet, and another made, by which new surfaces are brought into contact with each other, and the pile again pressed strongly. This operation, which is called parting, is done two or three times for the best papers. The paper is now counted into quires, folded, and packed up into reams.

The size is made from skins and other animal substances, and is required to prevent the ink from spreading among the fibres by capillary action. Blotting-paper is not sized.

The paper-making machine is constructed in such a manner as to imitate, and in some respects to improve, the processes used in making paper by hand; but its chief advantages are, that paper can be made of any size which can possibly be wanted, the surface is a regularity which leaves the other mode of making it so irregular and inaccurate as in a measurable distance. As much as 25 square feet can be made in a minute, and consequently 15,000 square feet in a working day of ten hours.

The paper-making machine was invented by Mr. Fourdrinier, and as now used, with the improvements applied to it by himself and others, is, in the simplicity and ingenuity of its contrivances, not surpassed by any other in the whole range of British machinery.

One of the processes of making paper by the machine as briefly as we can, referring those who wish for more minute information to an article in No. 96 of the "Penny Magazine," which is accompanied by a large wood engraving of the machine itself.

The raw material flows from the vat upon a wire frame, or sifter, which moves rapidly up and down so as to force the fine filaments of the pulp through the wire, whilst it retains any knots or other unsuitable matter. Having passed through the sifter, the pulp flows over a ledge in a regular manner, and is received upon an endless web of wire-gauze, which presents an interrupted surface of five or six feet long. The wire-web moves forward with a motion so regulated, as, taken in connection with the quantity of pulp allowed to flow upon it, to determine the regularity which is given to the pulp at the same time prevented from flowing over the sides by straps which regulate the width of the paper. Before the pulp, now no longer fluid, quite the plane of the wire, it is pressed by a roller covered with felt, and is then taken up by an endless web of felt, which forms an inclined plane, and gradually moves forward absorbs a further portion of the moisture. The pulp has now seized by a pair of rollers, between which it is pressed, and then it passes upon another inclined plane of felt, which conducts it to another pair of presssing rollers, where it remains, and only requires to be made dry and smooth. To effect these objects, the machinery conducts it over the polished surface of a large cylinder heated by steam. From this cylinder it passes to a second, larger and hotter, and then to a third, which is still hotter than the second. After that it is subjected to the pressure of a woolen cloth, which confines it on one side while the cylinder smooths it on the other. It is then conducted by another roller to a reel, on which it is wound, perfectly dry and smooth, and ready to be cut into sheets for use.

It is now necessary to introduce the pulp, which has been introduced upon the wire web at one extremity of the machine, is delivered at the other in the state of perfect paper.

In printing-paper the size is commonly added to the pulp, but writing-paper is sized after the sheets are cut, as in ordinary made-paper.

The paper, after it is cut, is examined, to remove knots or specks. and to put aside damaged sheets. It is then counted into quires of 24 sheets and folded, and lastly put up into reams of 20 quires, pressed in the reams, and tied up in wrappers for sale.

Machines for cutting the paper into sheets of any size which may be required, have been invented by different persons. They are separate from the paper-making machine, and are beautiful contrivances, but too complicated for description without illustration.

In most of the Fourdrinier machines a partial vacuum is produced under the endless wire-web by means of large air-pumps. The atmosphere is thus made to press upon the pulp, and the moisture is forced through the wire. Going however to the change of stroke of the re adjustments, a uniform degree of vacuum cannot be maintained, so that the pulp receives various degrees of pressure, and consequently the paper is made of unequal thickness. To remedy this defect, by rendering the vacuum as uniform as possible, two patents were taken out in 1839, one of which proposes to effect the purpose by substituting a revolving fan for the air-pump, and the other by using hydraulic air-pumps working on the principle of gas-holders, instead of the common ones.

Various patents have been taken out for improvements in parts of the machinery, or for other machinery to be applied in various stages of the process. One was taken out by Mr. Dickinson for an apparatus to separate the knots and lumps from the pulp, by making it pass through the paper, by a revolving cylinder covered with a spiral wire attached to metal bars. Other improved processes for the same purpose have been invented. A patent was taken out by Messrs. Towgood and Smith, the object of which is to apply the size to the paper as it comes in a continuous sheet upon the endless wire-web, and by means of this apparatus is performed by rollers, the surfaces of which are supplied with size, which is transferred from them to the newly-made paper as it passes between the rollers. Mr. Dickinson has also a patent for uniting two layers of pulp in order to produce paper of an advantage in thickness. The combination of two or more sheets of pulp has been long employed in the making of thick drawing-paper and Bristol boards by the process called couching, but Mr. Dickinson's contrivance affords the means of doing it in a common paper-machine with the utmost convenience.

Various wire-marks, or water-marks, as they are called, were formerly applied to paper to distinguish it. On the paper used by Caxton and the other early printers, these marks consisted of a head and motto, a coat of arms, a shield, a jup, &c. A head with a fool's cap and belts gave name to the paper called foolscap, and post paper seems to have derived its name from the mark of a horn, which was formerly carried by the postman, upon his arrival. Hence this name has now been commonly marked with the name of the maker, and the date of the year when it was made.

PAPER TRADE. The manufacture of paper being a branch of industry which does not essentially call for the employment of any large capital, is carried on in every country, and consequently from none is there any considerable exportation. England is perhaps better qualified than any other country for the cheap production of paper, because of the successful application to that purpose of expensive machinery; but this great advantage is lost to some
extent counterbalanced by the impediments thrown in the way by Excise regulations, and the shipments are consequently in great part confined to our own colonies and foreign possessions. In the account of exports kept at the Custom House, paper is not distinguished from other articles of stationery, but it necessarily forms the greatest part of the articles entered under that name. The total value of exports entered in 1837 was 136,424l., and of this sum the large proportion of 135,424l. was made up of shipments to our foreign possessions. It was shown by an account produced before the Commissioners of Excise Enquiry in 1836 that the weight of paper of all kinds exported in the previous year did not much exceed 4 per cent. of the quantity made.

Until 1837 the duty on paper was charged in two classes. That made wholly out of old tared rope, without extracting the pitch or tar, was considered as second-class paper, and paid in the large proportion of 2s. 6d. per lb. In the year above mentioned this distinction was abolished, and the duty on all kinds of paper was fixed at 1s. 6d. per lb., which gave an immediate impulse to the trade. The effect of this change in augmenting the quantity used may be seen from the following figures:

The quantity of paper of each class made in the United Kingdom in 1835 and 1836 was as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>First class</th>
<th>Second class</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1835</td>
<td>66,179,555</td>
<td>66,202,662</td>
<td>132,382,217</td>
</tr>
<tr>
<td>1836</td>
<td>71,883,095</td>
<td>14,906,226</td>
<td>86,789,321</td>
</tr>
</tbody>
</table>

The rates of duty chargeable on the importation of paper from any foreign country are:

<table>
<thead>
<tr>
<th>Class of paper</th>
<th>Duty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown paper made from old rope</td>
<td>3d. per lb.</td>
</tr>
<tr>
<td>Other kinds of paper</td>
<td>9d. per lb.</td>
</tr>
<tr>
<td>Paper-hangings</td>
<td>1s. per sq. yd.</td>
</tr>
</tbody>
</table>

These duties are nearly nominal, as with the exception of some particular kinds of drawing-paper, of which a small quantity finds its way, and paper hangings, which are imported on account of the elegance of their patterns, all the paper used within the United Kingdom is of home manufacture.

PAPER MULBERRY. [BRUSSELSWEL.] PAPER NAUTILUS, or PAPER SAILOR, the popular English names for the Nautica (Nautiiolus) or Nauitca (Nautilus) of Aristotle (Hist. Anim., iv. i.) Argonauta of Linneaus. This animal has been from the earliest periods an object of great interest to zoologists, on account of the beautiful accounts of its sailor-like habits handed down to us from the ancients—we need only refer to the accounts of Aristotle, Pliny, Ælian, Oppian, and others—and in consequence of the difference of opinion entertained with regard to the law by which they are governed. It is well known that the cephalopod found in it was a mere parasite, or, even worse, a pirate that had destroyed the legitimate owner and possessed himself of the shell; and others, that the animal was the lawful possessor and original constructor of the shell.

Among those who supported the former opinion were Lamarck, de Montfort, Ranzani, Poli, and De Ferrussac, to say nothing of Cuvier, the inclination of whose mind evidently was that the shell belonged to the animal, though he only designates the opinion of those who held the contrary as extremely problematic. Professor Owen appears to have been early inclined to this view of the subject. Dr. Leach,M. Rafinesque, M. De Blainville, and Mr. Gray, stand conspicuous among those who denied that the Oxythus found in the shell of the genuine Argonauta of Linneaus was the constructor of the shell.

The reasoning of those who held that the Argonautic cephalopod was the constructor of the shell appears to have been founded on the numbers found always living in that shell, and, in the case of Poli and De Ferrussac, upon the supposed discovery of the animal and shell in the egg.

Those who opposed these views, or still doubted, and confess that we were among the latter, thinking it highly probable that the shell bore a certain resemblance to Carinaria, were struck with the supposition which would be manifested if the cephalopod really was the natural inhabitant. Evidence that the animal was not affixed to the shell had been given over and over again till it became large and cumulative, and had never been controverted. The animal had been seen to quit it alive, and to fall out when dead by its own weight upon reversing the shell. How then was the shell to be secreted? Again, the specimens found in the greatest number of the shells were those in which the spiral part of the shell filled up, at least, all the spiral part of the shell; and on these the body of the animal rested. An Oxythus, nearly allied to Oxythus, was caught in the Madras Roads with its ventricose body firmly imbedded in a epeoli, and Octopus arenarius had been found in a Doleus. These, and other facts, with which we will not weary the reader, seemed very powerful; but if any credence is to be given to the carefully conducted experiments of the lady whose reliable observations we shall now proceed to notice (and, after what we have seen no reason to place in the slightest suspicion), the question is now set at rest, that it was not by Poli, who must, if this lady's experiments were correctly made and accurately reported, have been in error when he supposed that he saw the animal shell in the egg.

In 1838 Madame Jeannette Power laid before the Academy at Catania her 'Osservazioni fisiche sopra 2 Pulpi dell' Argonauta Argus, in which, after a long and careful course of inquiry, she declared the following results—a fact that cephalopod mollusks were the actual constructors of the shell which it inhabits; 2d, the closing up of the doubts with regard to the first development of its eggs; 3d, new facts respecting its habits.

In order to obtain the data from which Madame Power came to these important conclusions, she had constructed which were eight palms long and four broad, with a convenient interval (three or four lines) between the bars, which allowed the water to enter freely when placed in the sea, whilst the escape of the animal was prevented. Madame Power placed these cages in a shallow bottom in the near the citadel of Messina, where she could examine them undisturbed, and enclosed in them a number of living Argonauts, which she supplied every two or three days with food consisting of naked and testaceous mollusks.

The two first facts that she establishes is that the cephalopod of the Argonaut—It is furnished with eight arms, bar on each two rows of suckers: the first two arms are more robust than the others, and should be so, because they were used to support the sails, which, spread out, act before the wind as a sail. At the base they have, on the other side of the double row of suckers, like the other ones, but from the inferior row, at about an inch from the base, two sets of suckers: one set corresponding to the two arms; the other set corresponding to the ribs of the shell. These are protected by a shell so called because it is placed exactly over the keel of it in such a manner that each sucker corresponds to each point in which the ribs of the shell terminate until they reach the two margins of the spiral.

Madame Power compares these with the two well-like lobes of the mantle of Cypraea (Cyprig), vol. iv. p. 254), not only from the manner in which they cover the shell, but because she has reason to believe that the formation of the shell is the result of a transudation from the mantle to the walls of the shell, the corrugations of which, in secreting the calcareous matter, may be the cause of the ribbed form of the shell.
This consideration, she remarks, may weigh in obviating the difficulties of those who cannot imagine how a shell containing a cephalopod should present no resemblance with the folds of the animal compressed within it. For if they examined the calcariform depression of the membrane of the sails, they would find not only the series of little points corresponding to the suckers, which adapt themselves to the keel of the spiral, but an explanation of the disposition of the ribs, and of the smooth and parallel condition of the outer face.

The sail, when spread out, presents, according to Madame Power, a silvery surface, speckled with concentric circles of spots, with a black spot in the middle, surrounded with a beautiful gold colour: this and the viscosity of the suckers along the keel and the spiral assume a purple colour so vivid that it approaches that of the Janthina. The mouth, the head, the bag, and the branchiae, did not present Madame Power with any novelty beyond what had been already well described by naturalists, and which is common to the Cuticles of the Class,

The Coelenterates, but she makes two observations with regard to the funnel, which she believes to be new, 1st, that it fulfils the office of a pump or proboscis rather than that of a funnel, and that the animal employs it when swimming with its arms on the surface of the water, as a helm, elongated, and frequently by observation, she notes the shell, at the same time that the spiral serves as a prow."

"Reflecting," says Madame Power, "on the delicacy and fragility of the shells, and wishing to trace the cause of their being so rarely seen broken, I determined to touch one while dwelling close, as I was considered disposed to do. I dissected it with a knife, so as to judge between my fingers, to learn what degree of flexibility it would admit, I discovered that it was extremely plant, so much so as to admit of the two extremities of the great curve being brought in contact without breaking; and indeed, the sixth day after the capture of the shell, the young pulps were found to have disappeared, in order that they might not be continually liable to be broken in pieces by the restless and uninterrupted movements of their pulp, as well as by the shocks which they would be likely to suffer in the depths during a stormy sea. In this case, the external superposition of the sail-arms keeps the shell firm, and the young pulps have no shell."

Mohula, ἄχ. — Madame Power states that Argonauta Argo in its natural state is to be found in the north-eastern part of the country, and even in the port, almost all the year through, in the largest or smaller, either. Their true season she considers to be autumnal, or in the months of September, October, and November. It may be, in her opinion, either because the current brings them at that time, or that food is more plentiful, or because it may be the season of their fecundation. To examine this is the usual time for the port and where the anchored boats tie thickest. When the Argonauts are on the surface of the water, if they observe any person, they fold the sail-arms over the shell and stow the rowing-arms inside it: then they sink to the bottom. If, on the contrary, the water is calm, and the sails still in a horizontal position, they eject ink, like other cephalopods, to make the water turbid, thus gaining time to hide themselves in the mud.

Those in the cage, when closely pursued, would, after ejecting their ink, spring out of water from the tube, and then, by rapid vibration of the tentacles, they would give an appearance of being in their original formation, cautiously cut off the spire of divers Argonauts at the time of their fecundation. In the direction of its axis she found in a little new-born pupa rolled up near to the back of the shell that the first of her observations, she perceived that between it and the bottom of the parent shell there was a thin membrane, disposed in the same form as the curve of the spire, and fitted to the rolled-up little pupa, as if it were completely formed for their use. It was inhabited by the young pupa, contained in a fine membrane in the same form as the spire, and embraced the young pupa.

In September, 1853, Madame Power enclosed in her cage some Argonauts at the time of their fecundation, taking the precaution to examine them before four days, and found that the irritability is such that they die if handled much. They were placed in a basin, and the observer was so posted that they could not see her.

On the 14th Madame Power found in one of the shells a little pupa four inches long. Other shells were searched, and, in some, little pupae were found: in others none. On the 18th two parent pupae were dead. In the shell of that wherein she had first seen the little pupa she found that it had already passed into the spire. On the 24th, upon examining the shells, one of them was completely covered with its thin shell, which was 31 inches in length. This little animal appeared to be completely formed, and its shell had the form of the spire in which it had been framed.

All the experiments made by Madame Power had the same results; her inference is, that the young Argonaut, when excluded from the egg, is naked; that it is progressively developed in the end of the spire of the parent; and that after a certain period it begins to form its shell.
As far as Madame Power has observed, not more than two or three eggs develop themselves at the same time; and when the young have grown to the size of nine lines, they suspend themselves in the spiral of the parent, where the other arms are thrown out in the manner of buds. The young one takes three days to arrive at the length of nine lines, and four in the spiral to develop itself. The parent retains the young for three more days under her head from the mouth of the shell.

An attempt was made by Madame Power to produce the development of the eggs as far as the production of the young pupa, without the aid of the mother, by suspending them in the sea-water, in which they were changed through the day. This attempt failed; the eggs swelled indeed, but it was the putridity of putrefaction.

Madame Power concludes from this experiment that the glutinous material in which the young are enveloped in the spiral of the Argonaut is the same as the glutinous secretions of other molluscs, that this material is evidently a parental secretion, it may be said that without her aid the eggs could not be developed, and the young shell cannot have its foundation laid in the end of the spiral.

I must now, Madame Power speak for herself. In spite of these successful experiments in favour of the shell being the property of the pupa of the Argonaut, I was anxious to be assured of the fact in a manner not hitherto attempted by others. If the Argonaut, said I, attempts to put on a shell of its own, it is not to be attributed to the maternal instinct, but to a repair fracture. Although Signor Ranzani had said that it was not to be believed that the pupae of the Argonaut should be so ill provided with means necessary for the preservation of their fragile existence, that if the first habitable shell should be broken, they cannot construct another; still I thought, from his mode of expression, that he had never himself made experiments in proof of this. Moreover, I, who have made experiments on a hundred of these molluscs, have found that they have often lost their shell, they are incapable of constructing another, and die; but I broke in several places the shells of twenty-six individuals, and, to my great satisfaction, found, after thirteen days, the fractures healed in all the survivors, which were not more than three. The next day I found the shell was stouter, the broken parts united, not so white; it looked also a little rough and disturbed, neither did it present the usual risings, and, instead of ribs, it had some longitudinal furrows. Being desirous of observing in what manner the animal operated in repairing the broken shell, I took one day after the first experiment, and found that the aperture was covered by a thin glutinous lamina, which, somewhat in the manner of a cobweb, unites the two margins of the broken shell. The next day the lamina was, to a certain degree, thickened and united, and, at the expiration of ten or eighteen days, the new piece had become quite calcareous. Whilst the Argonaut was in the act of mending the fractures in its shell, I am quite sure that it applied the sails to the shell and wrinkled them upon it, and by this movement I considered that the glutinous secretion which finally became calcareous was deposited.

So far Madame Power has shown that the Argonaut has the power of repairing fractures in the shell, like other Testacea, though not exactly by the same means; but she noticed another power, which she states that, as far as she knows, has not been observed in other testaceans. She found that whenever the animal which is going to repair its habitations can find pieces of other Argonaut shells, it takes, by means of its mouth, a fitting and broken shell, and holds it in the fractured place, till it has secreted the material necessary for the firm attachment of the fragment, thus saving the expense and trouble of a secretion for supplying the whole area of the fractured aperture. After such a secretory process, says Madame Power, nothing seems to have sufficiently proved that the pupa of the Argonaut is the constructor of the shell in which it lives, and out of which it cannot exist long.

Now though there may appear in the account of these experiments, the degree of their having been drawn up by one not deeply versed in zoology, there is an air of truth and sincerity about them that makes them to us as valuable at least as any that could have been the result of the inquiries of a more learned observer. Madame Power indeed has, in our opinion, come to a somewhat hasty conclusion that these animals are hermaphrodites, because all the young were examined by her (more than a hundred) were furnished with eggs; but this inference is evidently not deemed conclusive by her, for she states her intention of making careful anatomical researches on this subject, which she had not vowed to the Juno of antiquity.

We have heard some stress laid on the mistake made by Madame Power, when she, at first, fancied that the parasitic Hectocotylus of Cuvier was the young of the Argonaut. We think but little of it; and indeed the very information that was given her by Professor Owen, who detected her genius, communicated to her, seems to have made her more vigilant. In a second paper, with the title of 'Nuove Observazioni sullo Uovo del Polipo dell’Argonauta Argica,' by the same lady, after alluding to this mistake, she makes a more correct explanation, and states that the young of the Argonaut were examined by her (more than a hundred) and found to be furnished with eggs; and the elephant, on which sheurgeon rested on the shell, came from the young of the Argonaut. We have not the least doubt of her correctness on this point, and it is certain that the young of the Argonaut are most peculiar in their structure and habits, and that the female Argonaut is furnished with a peculiar organ, the shape of which seems to resemble that of a lobster, and which the animal is said to use as a sort of pilot, and to which it is said to be fastened. Madame Power has, in her 'Transactions of the Bolognese Academy,' Captain Philip Parker King, R.N., during his well known voyage, met with some specimens of Argonauta argica in a rather curious way; and though he expresses his opinion with much modesty, it is plain what the inclination of that opinion was.

On our passage from Santos to St. Catherine’s, in lat. 29° south, we passed near the bay of Caraguata, 'a doll concerned in Phaeno,' the maw of which I found filled with shells of Argonauta tuberculosa, and all containing the Octopus Ocythoe that has been always found as its inhabitant. Most of the specimens were crushed by the narrow passage with the stomach, but the smaller ones were quite perfect, and had been so recently swallowed that I was enabled to preserve several of various sizes containing the animal. To some of them was attached a nidus of eggs, which was deposited between the animal and the spire. The shell was thickened, and at the expiration of ten or eighteen days, the new piece had become quite calcareous. Whilst the Argonaut was in the act of mending the fractures in its shell, I am quite sure that it applied the sails to the shell and wrinkled them upon it, and by this movement I considered that the glutinous secretion which finally became calcareous was deposited. *

* Aristotle speaks of the shell as being like a hollow pecten (argyra), and not naturally adherent to the polypus. He also states that it tends very frequently near the land, so that it is thrown by the wave upon the sand, when the shell slipping from it, it is caught, and dies on land. (Hist. Anim., iv. 1.)

* A. rufa of Owen.
of the shell, sometimes next the involuted spire. 3. That the animal does not occupy the posterior part of the shell. 4. That the form of the animal and of its parts offers no concurrence or analogy with the shell. 5. That the shell is too opaque to have permitted the influence of light in the derivation of the third shell of the cephalopod of the argonaut. 6. That it is very far from being true that the argonaut-shell possesses the flexibility and elasticity requisite to harmonise with the locomotive and respiratory movements of the animal. 7. That the animal suffers no appearance of inconvenience when deprived of its shell. 8. That a cephalopod has been discovered in the Sicilian seas like that which inhabits the argonaut, but without a shell. These data are designated by Professor Owen, to whose observations we shall presently advert, as false, and with the exception of the latter, as a partially false, being true when stated with reference to the more mature animal only. The other arguments of M. de Blainville are noticed by Professor Owen as founded on undoubted or admissible facts; but the Professor denies the conclusion drawn by M. de Blainville.

M. Sander Rang in consequence of the appearance of M. de Blainville's memoir or letter, published in Guerin's "Magazine de Zoologie," a very interesting paper under the title of "Documents pour servir à l'Histoire Naturelle des Céphalopodes Cryptogènes." In this paper, Rang's observations are confirmatory. — 1. Of Madame Power's statement that the siphon is applied to the part of the shell opposite the involuted spire; 2. Of the accuracy of her description of the relative position of the so-called sails of the argonaut with respect to the shell; 3. Of her discovery of the faculty possessed by the animal of repairing the shell, and many other points.

No one will refuse to M. Rang the acknowledgment that he is not only a very accurate observer, but that he is versed in the natural history and anatomy of the mollusca generally; so that here at least no doubt can be thrown on the observations.

M. Rang however appears to have been staggered by the pertinacity of M. de Blainville; for after all, he sums up by declaring himself to be 'in the most complete state of uncertainty.'

In February, 1839, a highly interesting and valuable series of specimens of the Paper Nautilus (Argonauta Argo) consisting of the animals and their shells of various sizes, of ova in various stages of development, and of fractured shells in different stages of reparation, were exhibited to the Zoological Society of London, and commented on by Professor Owen, to whom they had been transmitted for that purpose by Rang, who had formed the collection in Sicily, in 1838. In the course of his comments the Professor went at large into the subject, and in addition to the observations above alluded to with regard to the alleged false facts and admissible facts wherein M. de Blainville has been mistaken, and his erroneous theory of the siphon, as in our opinion, with signal success, the arguments of those who adhered to what may be termed the parastatic opinion; and recapitulated as follows the evidence which, independently of any preconceived theory or statement, could be deduced from the specimens then on the table:

1. The cephalopod of the argonaut constantly maintains the same relative position in its shell.
2. The young cephalopod manifests the same concordance between the form of its body and that of the shell, and the young cephalopod of the other as do the young of other testaceous molluscs.
3. The young cephalopod entirely fills the cavity of its shell; the fundus of the sac begins to be withdrawn from the apex of the shell only when the ovarium begins to emit its influence.
4. The shell of the Argonauta corresponds in size with that of its inhabitant, whatever be the differences of the latter in that respect. (The observations of Poli, of Prevost, of King, and of Owen, are to the same effect.)
5. The shell is capable of the requisite flexibility and elasticity which the mechanism of respiration and locomotion in the inhabitant requires; it is also permeable to light.
6. The cephalopod inhabiting the Argonauta repairs the fractures of its shell with a material having the same chemical composition as the original shell, and differing in mechanical properties only in being a little more opaque.
7. The repairing material is laid on from without the shell, as it should be according to the theory of the function of the membranous arms as calcifying organs.
8. When the embryo of the Argonauta has reached an advanced stage of development in ovo, neither the membranous arms nor shell are developed.
9. The shell of the Argonauta does not present any defined nucleus.

Professor Owen concluded a most elaborate commentary by stating that he regarded the facts already ascertained to be decisive in proof that the cephalopod was the true fabricator of the shell; and thus, in our opinion, is set at rest— principally by the experiments of Madame Power—a question which had divided the opinions of zoologists from the time of Aristotle, who left the subject with the following acknowledgment: 'But as touching the generation and growth of the shell, nothing is as yet exactly determined.'

M. Rang's account of the locomotion of Argonauta Argo is most interesting. When the animal was at rest and contracted within its shell, it exhibited the appearance figured below.
spectacle. Fixing some of the acetabula of its fore-arms upon the bottom of the basin, it crept itself upon its head, spreading out its disc, and carrying the shell straight above it in the normal position of the shells of gastropods; then, beginning to crawl, it presented the appearance of a pec-tinibranchiate mollusk, as M. Rang had remarked in the note to the Academy of Sciences. Half drawn back into its shell, the animal appeared to crawl upon its disc, the palmatures of which were a little raised to follow the movements of its arms. The body was hidden in the shell; the siphon placed in the anterior part of it was turned forwards; the arms which were at liberty were very much protruded and twisting round, two before and two on each side: the base of the two large arms seemed to prolong backwards the locomotive surface, and then rising along the keel, they again covered it with their large membranes, as when the pulp was swimming in deep water. ‘Thus,’ continues M. Rang, ‘this mollusk, at once pelagic and littoral, presents a most singular anomaly: when it swims at the surface of the water, having its ventral part lowermost, and when it crawls along the bottom having it, on the contrary, uppermost; two things which are completely contrary to what we see among the pelagic mollusks on the one hand, and the littoral mollusks on the other.’

Argonauta Argo moving on its head at the bottom. (Rang.)

The progress of the animal, when moving as last above represented, was slow, and it worked itself onwards like the gastropodous mollusks. M. Rang remarks that the reputation was only apparent; for the suckers really caused the motion.

When the pulp was at the point of death, it drew in by slow degrees its large arms and their membranes, and contracted them upon themselves and all the other arms, so as to obstruct the opening of the shell. At this moment the shell was moved, and the pulp separated itself from it, not voluntarily but accidentally, for it no longer held it in any way. It appeared at first to become a little reamimated, made some movements in the basin upon its head, then fell from weakness, and soon died. All this passed in less than ten minutes.

Translations of the memoirs of Madame Power and of M. Rang will be found in The Magazine of Natural History, vols. i. and ii., N. S.

In the Dibranchiate Octopods, generally, the ovary is a spherical sac with thick parietes. In the Argonaut the oviducts are two in number, long and convoluted, furnished with glandular cells throughout, but without partial enlargements: there are no separate nidamental glands. These oviducts are continued by a short common passage from the ovary and form several convolutions before they ascend to their termination, which is the same as in Octopus; but they differ from Eledone and Octopus, in having no glandular laminated bodies developed upon them: the minute ova of the Argonaut are consequently connected together by the secretion of the lining membrane of the long and tortuous oviducts. These ova occupy a greater or less proportion of the bottom of the shell; they are oval, about half a line in length before the development of the embryo has commenced, and are connected in clusters by long filaments. In the museum of the Royal College of Surgeons is a preparation (No. 2557 B., Physiological Series) of an Argonaut (Argonauta argo; Owen) with the ventral parietes of the abdomen and the gills removed, to show the female organs of generation. The ovary is lodged at the fundus of the visceral sac. The two oviducts, which are continued from its posterior part, are convoluted at first, and then advance straight forwards to the base of the funnel. (Cat., vol. iv., Owen.)

From the time of Aristotle the Cephalopods have been known to be diocious with reference to the sexual organs, and it appears to be a great majority of females. We are not aware of a single instance of a male Argonaut having been taken: it remains to be proved whether this arises from the comparative activity of the males, their relatively small numbers, or from their not being furnished with a shell at all.

Place in the System.—The natural situation of Argonauta appears to be that assigned to it by Professor Owen, namely in the Testaceous family of the tribe Octopods of M. Bang's second order of Cephalopoda—Dibranchiata.

Generic Character.—Body oblong, rounded; mantle ad-hering posteriorly to the head; first or dorsal pair of arms dilated and membranous at the extremity. Foot without a valve, but articulated at its base by two half-and-half joint to the inner side of the mantle. Branchial appendages with fleshy appendages. No internal hae-

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The fossil genus *Bellerophon* is placed by Professor Owen with *Argonauta* in the family of Testacean Octopods.

**Bellerophon.**

**Paper Hangings,** a term applied (somewhat incorrectly) to the stained paper pasted against the walls of apartments, &c. The word 'hangings' was originally and properly applied to the woven or embroidered tapestry with which the walls of elegant rooms were covered. From the time necessary for their production, these were too costly for any classes but the wealthy. About 200 years ago however, a mode was devised of printing or painting a pattern on sheets of paper, and pasting them against the walls of a room; these are 'paper-hangings,' and they have greatly contributed to the comfort and cleanliness of domestic apartments.

There are three modes of producing the required device. 1. Wooden blocks are carved, representing in relief the outlines of the figure; an impression is taken from these blocks, and the design is completed by painting with a brush. 2. A sheet of paper, leather, tin, or copper, is cut out into the required device, and laid on the paper to be stained; a brush, dipped in a coloured pigment, and worked over the surface of the perforated plate, conveys the pigment through all the perforations, and forms a pattern on the paper. A block is carved for each of the colours to be employed, and an impression from all the blocks in succession fills up the design on the paper. The first of these modes is too slow and costly for ordinary use; the second produces imperfect outlines, and is not chiefly employed (under the name of *stencilling*) to paint a pattern on the plaster walls of a room, without using paper-hangings; the third, which is the mode almost exclusively employed at the present day, is described here.

The paper is printed in pieces twelve yards long, and to produce these it was formerly necessary to paste sixteen or eighteen sheets of paper together at the edges. But machine-made paper now allows the paper-stainer to procure the whole length in one piece. A 'piece' is laid out on a table, and the ground-colour applied, consisting of pounded whiting tinted by the addition of some pigment, and liquefied by the aid of melted size; this is laid on with large brushes. When the paper is dry, it is ready to receive the print. Let us suppose the pattern to contain three colours, red, dark green, and light green. Three blocks are carved in hard wood, the uneaten parts (as in a common wood-block) representing the device; each block is intended for one colour only; and care is taken that all shall combine their devices properly, when printed. The three pigments being mixed with melted size, in separate vessels, one of them (say red) is spread with a brush on a wooden frame covered with leather or flannel: the proper block is laid face downwards on the wet paint, takes up a layer of it, and imparts it to the paper, on which it is immediately pressed. Another similar impression is made adjoining the first; and so on, till the whole 'piece' has been printed with the red device. When dried, the paper goes through the same process a second time, with the substitution of a different colour and a different block from those before used. The third process with the other shade of green finishes the painting. Each block is furnished with small pins at the corners, by the aid of which the successive impressions are made to correspond properly. As many as seven or eight colours are sometimes employed in one pattern, and generally speaking there must be as many blocks as there are colours.

Some paper-hangings have a glossy or 'satin' ground. To produce this, a ground of satin white, properly tinted, is laid on; this ground is then rubbed with powdered lampblack worked by means of a brush, until a gloss is produced. After this the printing proceeds as usual. These 'satin' papers sometimes receive an additional beauty, by being passed between two slightly heated rollers, one of which has an engraved pattern in imitation of watered and figured silk. ; this pattern is thus imparted to the paper. *Flock* papers are those in which a portion of the pattern somewhat resembles woollen cloth. When the proper ground-colour has been applied, the device is printed, not with a coloured pigment, but with a gold, japan gold, and with white gold. In the last case, the sprinkled flock, consisting of fragments of woollen cloth cut into a sort of sort and dyed. The flock adheres to the gold size and can easily be brushed off the other parts. Sometimes flocks of two or three colours are employed; these are laid on at separate times. *Striped* papers are...
sometimes produced in a singular manner. The colour (rather more liquid than in other cases) is contained in a trough having parallel slits in the bottom. The paper is made to flow, a layer of the bottom of the trough, thus forming a deposit of colour in parallel lines, through the slits in the bottom of the trough. By a modification of this method is produced what is termed a blended ground. A trough, containing many small vials filled with different tint cells, each containing one tint, each to a cell. A long narrow brush being dipped into all these cells, takes up a portion of each tint, which it applies to a roller; from the roller the pigment is transferred to a revolving brush, and from the brush to the paper. Thus a number a blend or shaded ground, which afterwards receives any desired pattern.

Bronze or imitation gold-powder is frequently applied to papers. A device being printed in Japan gold-size, the powder is lightly rubbed over the paper, and adheres to the spots. It is thus, more or less, equivalent to the use of pan or caryatid. The duty on the paper itself has been reduced from 3d. to 2½d. per pound; while the additional duty of 1½d. per square yard of paper- hangings, considered as such, has been wholly repealed. The reduction of price has carried off a much larger class of persons to get their apartments papered; and it will in this way be productive not only of a great additional demand for paper, but of a great increase of comfort and cleanliness. (M'Culloch.) Paper hangings are indeed now made for so low a price as five-pence for the piece of twelve yards.

With regard to the patterns of paper-hangings, we may remark, that the attention which has lately been given to the promotion of the arts of design will probably lead to many curious and beautiful patterns; and the device of paper-hangings, as well as for other ornamental productions. A few years ago Mr. Loudon suggested that: an instructive natural history paper for cottages and the walls of nurseries and school-rooms might be formed, by printing figures of all the common and more important plants and animals, with the scientific and popular names beneath them; each plant or animal being surrounded by lines, so as to appear either in frames or as if painted on the ends of stones and bricks. An ingenious suggestion on the subject of intellectual paper-hangings has recently been made in No. 504 of the Penny Magazine.

PAPHLAGONIA (Παπλαγονία), a province of Asia Minor, also called Pylæmonia according to Pliny (vi. 2), was bounded on the north by the Euxine, on the south by the Phasis, and on the west by Pontus, and on the east by Bithynia. It was separated from Bithynia by the Parthenius (Olu or Barten), and from Pontus by the Halys (Kizil-erma), which was also its eastern boundary in the time of Herodotus (i. 672).

Paphlagonia is described by Xenophon and Strabo (v. 6, v. 6.) as a country having very beautiful plains and very high mountains. It is traversed by two chains of mountains, running parallel to one another from east to west. The higher and more southerly of these chains, called Olygssas by Xenophon, and Olygssas by Strabo (vii. 650), which extends from the Hellespont to Armenia, and was known to the ancients under the names of Ida and Temon in Mysia, and Olympus in the neighbourhood of Brusa. (At the mouth of the Halys. (Strabo.) The other, however, appears to give the name of Olygssas to the chain of mountains in the northern part of Paphlagonia, on which the Paphlagonians had built many temples. The country between these two chains of mountains is drained by the Amasis and Halys, which flows into the Halys. There were several small streams which flowed from the mountains in the north of Paphlagonia into the Euxine, but the only river of importance besides the Amasis and Halys was the Patnusian, which is said by Xenophon to be impassable. (Xen. Anab. v. 6. 5.) In the neighbourhood of Pompoeopolis, in the central part of the province, was a mountain called Sandaracurcium, where, according to Strabo (xii. p. 562), sandaraca was obtained in mines, which were worked by criminals, who died in great numbers in consequence of the hardships of the labours. The sandaraca, spoken of by Strabo was probably the same as sinopia, which was a kind of red ochre, obtained by the Greeks from Sinope, from which place it derived its name.

The Paphlagonians are said by Homer (ii. 851, 853.) to have celebrated as the birthplace of the goddess Paphian, and to have been the country of Pyliæmon from the country of the Helleni. This name of the Helleni in connection with the Paphlagonians seems to have puzzled some of the ancient writers. Several explanations of the passage were given; but the one which appears most probable is that the Helleni were a Paphlagonian people, who followed Pyliæmon to Troy, and, after the death of their leader, emigrated to Thrace, and at length wandered to Italy, where they settled under the name of Veneti. Pliny (vi. 2) also connects the nation of the Helleni with the Pyliæmon of the vicinity of Cornelius Nepos, but few modern critics will be disposed to attach much credit to a rambling story of this kind, which seems to have arisen merely from the similarity of the two names.

The Paphlagonians were subdued by Creesus. (Herod. II. 29.) They afterwards formed part of the Persian empire, and were governed by a satrap in the reign of Darius Hyasias (Herod. vi. 72), but they appear in later times as several other nations in the remote parts of the empire. The country was conquered by the king of Persia. On the return of the Ten Thousand, we find that they were governed by Corylus, who does not appear to have been a satrap (dara), Xenophon calls him, Anab., i. 4, 2, and who, it is evident, was of a race of the same name. After the death of Alexander, Paphlagonia, together with Pappadocia, fell to the share of Eumenes. (Diod. Sic., xii. 3.) It subsequently formed part of the kingdom of Pontus; but after the conquest of Pontus by the Romans, it appears to have belonged to the province of Galatia till the time of Constantine, who first erected it into a separate province.

The principal town of Paphlagonia was Sinope (Sinope, a colony of the Milesians (Xen. Anab., i. 1, 115,) which was said to have been founded by Autolycus, a companion of Jason. It was built upon a peninsula, and was for many centuries one of the most flourishing commercial towns of the Euxine. In the time of Strabo, when its trade had greatly decreased, it was a place of considerable importance, it was very strongly fortified, and possessed many handsome public buildings. The soil in the neighbourhood was very fertile, and the inhabitants were of mixed stock, the coast great numbers of pelamides, a species of sunny-fish. Sinope maintained its independence till the second century before the Christian era, when it was taken by the Romans, and annexed to the kingdom of Pontus. The town was built upon the sea, and was the capital of his dominions, and adorned it with many public buildings. During the war which he carried on with the Romans, it was taken by Lucullus. It was subsequently made a Roman colony. Diogenes the Cynic was born in the town of Sinope, Strabo, xii. 446, 447. In regard to the coast, wheat was the chief product, and the city was rich in wool and cloth. West of Sinope on the coast were—Harmone, of which the Ten Thousand anchored for five days (Xen. Anab., i. 1, 15-17); Abentheis, afterwards called Iconium (Ainab), which is described by Strabo (xii. 445) as a small town, and the home of the treasurer of the Persians, to whom Lucian has given us an account; and Amastris (Amasea), formerly called Sesamus, under which name occurs in Homer (H. i. 833). Amastris was built upon a peninsula, on each of which there was a harbour. The coast on the north side of Amastris was that of Conon, Dioneus, the tyrant of Heraclea, and the daughter of Oxythras, who was brother of the Darius conquered by Alexander. She peopled the town with the inhabitants of Cynosur, Cymmenum, and Trunum. (Strabo, xii. 443.) Amastris is mentioned by the younger Pliny (Ep. xix. 99) as a beautiful town in his time.

The principal towns in the inland part of Paphlagonia were—Pompeopolis, on the river Amasia, which was built by Alexander after his conquest of Mithrdates; and Galatia, on the confines of Galatia, which was the residence of De-
PAPHEON, [Cyprus.]

PAPYRUS, one of the early Christian writers in the Greek language. He was a native of Hierapolis in Asia at the beginning of the second century. According to Cave, he flourished in the year 110, according to others in 115 or 116. He wrote five books, entitled "An Explanation of the Words (or Oecles) of the Lord," and walls now lost. In a passage of his work which is quoted by Eusebius, Papyrus professes to have taken great pains to gain information respecting Christianity from those who had known the apostles, and some remarkable statements of his respecting the apostles and evangelists are still preserved. According to Irenæus, he was himself a heretic of the Joannean party. He is said by Eusebius to have been a Millenniumian, and a man of little mind, "as appears," says Eusebius, "from his own writings." (Eusebius, Hist. Eccl. ii. 39; Cave, Hist. Lit., under "Papyrus;" Lardner's Cyclopaedia, pt. ii. c. 15.

PAPIER-MÂCHÉ, the French term for a preparation of moistened paper, of which many articles are manufactured in England, France, and Germany. Such articles have been made for those nations, more than a century, for in 1740 one Martin, a German vannier, was the first to begin the manufacture. He first learnt this manufacture from Leffeve. On returning to his own country, he was so successful in his exertions, that his paper snuff-boxes were called, after him, "Martins." So much was the interest taken in this manufacture that a special act was obtained in 1749, authorizing the purchase of paper, snuff-boxes, etc., of the paper-mâché articles, that Frederic II., in 1765, established a manufactory at Berlin, which soon became very successful. Brunswick, Nürnberg, Vienna, and other German towns, by degrees commenced the manufacture, and it is now carried on to a considerable extent.

Two modes are adopted of making articles of this kind: 1. by gluing or pasting different thicknesses of paper together; 2. by mixing the substance of the paper into a pulp and pressing it into moulds. The first mode is adopted principally by Emiliani, in which the substance of the paper is mixed with an emulsion of gelatine and glycerin. Common millboard, such as forms the covers of books, may convey some idea of this sort of manufacture. Sheets of strong paper are glued together, and then so powerfully pressed that it becomes perfectly transparent. It is then cut to the exact shape of the moulds, and the curvatures may be given to such pasteboard when damp by the use of presses and moulds. Some of the snuff-boxes are made by gluing pieces of paper, cut to the sizes of the top, bottom, and sides, one on another, round a frame or model, and then simply painted. The paper pasted on the frame of the pasted paper have on a fine black poliched imparted to them in the following manner:—After being done over with a mixture of size and lampblack, they receive a coating of a peculiar varnish. Turpentine is boiled down till it becomes black and thick, and this turpentine is sprinkled into it, with the addition of a little spirit of oil of turpentine. When the amber is melted, some sarsacolla and some more spirit of turpentine are added, and the whole well stirred. After being strained, this varnish is mixed with ivory-black, and applied in a hot room on the paper-mâché articles, which are then placed in a heated oven. Two or three coatings of the black varnish will produce a durable and glossy surface impermeable to water.

Paper-mâché, properly so called, is that which is produced by moulds in the state of a pulp. This pulp is generally made of cuttings of coarse paper boiled in water, and beaten in a mortar till they assume the consistence of a paste, which is boiled in a solution of gum-arabic or of size to give it tenacity. The moulds are carved in the usual way and the pulp poured into them, a counter-mould being employed to make the cast nothing more than a crust or shell, as in plaster-casts. In some manufactories, instead of using cuttings of made paper, the pulp employed by the paper-maker is, after some further treatment, poured into the moulds, and thus gives a more perfect cast. In the making of public buildings that paper-mâché is found most valuable.

Plaster and composition ornaments are very ponderous; carved ornaments are costly; but those of paper are light and of moderate price. In many of our theatres, in the House of Lords, in the Pantheon Bazaar, in some of the splendid steam-boats recently built, and in numerous other instances, where internal decorations are required, paper-mâché ornaments have been largely employed. Maps in relief are also occasionally made of this material.

The most remarkable instance of which we have heard of the employment of paper-mâché is one of which mention is made in a recent volume of Ersch and Gruber's "Allgemeine Encyclopädie," near Bergen in Norway a church has been built entirely of this material. There are nearly a thousand persons employed in this building. This building is octagonal without, but perfectly circular within. The interior of the walls, as well as the exterior of the Corinthian columns, is covered with papier-mâché. The roof, the ceiling, the statues within the church, and the organ case are all made of this substance. The papier-mâché was made water-proof and nearly fire-proof by an application of vitriol water and lime slaked with whey and white of egg. We may here remark, that paper roofs have been occasionally used in Italy. Sheet of paper can be cut to the outline of tar and pitch, dried, nailed on in the manner of slates, and then tarred again: this roof is waterproof, but it is unfortunately very combustible.

PAPILIONACEA. a faneful name given to the principal division of Lepidoptera, from the imaginary resemblance between their flowers and a Papilio, or butterfly. This appearance is owing to the excessive irregularity of the petals of such plants, one petal being large and expanded flat, and the other four arranged in a parallel manner, and such eggs are often found lying on the leaves of some example of this structure. In technical language, the back or largest petal is the vexillum, or standard, the two external of the lateral petals, alae, or wings, and the two interior, which adhere by one edge, the carina, or hede.

PAPINIA'NUS, AEMILIUS, was the judge of the jurist Q. Cervidius Scacola at the same time with Septimius Severus, afterwards emperor. Under the emperor Marcus Aurelius he held the office of advocatus bei, in which he succeeded S. Severus. After Severus his first emperor, Papinian was his libellorum magister, and prefect of the praetorium. Paulus informs us that he had given an opinion before Papinian in his auditorium. (Dig. 20, tit. 5, s. 12; Dig. 12, tit. 1, s. 40.)

Severus was at that time intimate terms with Papinian, and at his death recommended to him his two sons Caracalla and Geta. Caracalla murdered his brother, and shortly after put to death Papinian, together with Papinian's son, who was qustor. The cause of this execution is only obliquely stated (Suet. Sever. 21; but it appears that the rigid morality of Papinian was shocked by the brutal conduct of Caracalla, and that he showed his disapprobation of his unnatural act.

Few Roman jurists were held in higher estimation than Papinian. He is not only called the after-Sextus the Scacolus, but also the Eugenius. He was the first man who made the study of law than that only, but it appears that the rigid morality of Papinian was shocked by the brutal conduct of Caracalla, and that he showed his disapprobation of his unnatural act.

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Papianum, name of a patrician and plebeian gens in ancient Rome, who were formerly called Papii. (Cic. Ad Fam., ix. 21.) This gens was divided into several families.
lies, such as the Magnifican, Cercle, Cursaet, and Massonier, and the most celebrated of the different individuals of these families was the late Papius Curtius, who was the grandson of L. Papius Curtius, who was censor in the year in which Rome was taken by the Gauls (Liv., vi. 34), and son of Spurina Papius Curtius, who was military tribune in B.C. 379 (Liv., vi. 27-28). He was the last of L. Papius Curtius as master of the horse to L. Papius Crassus, who was created dictator a.c. 339, by the consul Manlius, in order to carry on the war against the Antelates. (Liv., viii. 12; Cic. Ad Fam., ix. 31.) The time of his proconsulship is doubtful. Livy mentions C. Papius and L. Papius Mucilius as consuls in B.C. 325; but he adds that instead of Papius Mucilius, the name of Papius Curtius was found in some annals. (Liv., viii. 23.) During the year of their consulship the Lex Papius Curtia was passed, which enabled no one to make or sell fitters or bowlers except for a crime which deserved them, and only until he had suffered the punishment which the law provided; it also enacts that creditors should have a right to attach the goods, and not the persons, of their debtors. (Liv., viii. 25.)

There is another Papius Curtius, who is said by Livy (viii. 29) to have been considered at that time the most illustrious general of his age, was appointed dictator to carry on the war against the Samnites. He appointed Q. Fabius Maximus to be his lieutenant, and during the winter he went to Rome to renew the suspicions, Fabius attacked the enemy contrary to his commands and gained a signal victory. On his return to the camp, he commanded Fabius to be put to death; but the soldiers expose the cause of the latter, the dictator stayed till the following day, in which time Fabius had an opportunity of escaping to Rome, where he placed himself under the protection of the senate.

The proceedings which followed are interesting to the student of the constitutional history of Rome, as they show that the principles of a remark in another part of his history (ii. 56), that after the decrees were expelled from Rome, a law was passed, enacting that in future no magistrate should be mad of the senate, and that the senators should be made Fabii of the senate; and as neither the entreaties of the senators nor those of the father of Fabius, who had been dictator and three times consul, could induce Papius to pardon him, the father of Fabius appealed (prosecuten) to the people and at length, at the earnest entreaties of the people and of the tribunes of the plebs, the life of Fabius was spared. Papius named a new master of the horse, and, on his return to the army, defeated the Samnites, and put an end to the war for the time. (Liv., viii. 29-37.)

The story is told in a somewhat different way with Q. Publius Philo, in B.C. 320, and again defeated the Samnites; and apparently a third time in the following year, though there appears to be some doubt upon the latter point. (Liv., ix. 7-16.) He was consul for the fourth time in B.C. 315 (Liv., ix. 20); and for the fiftieth time in B.C. 313 (Liv., ix. 28). He was again named dictator in B.C. 309, to carry on the war against his old enemies the Samnites, whom he defeated with great slaughter, and obtained, on account of his victory, the honour of a triumph (Liv., ix. 38, 40); after which time we find no further mention of him.

Papius Curtius, says Livy (ix. 16), was considered the most illustrious man of his age; and it was thought he would have been equal to contend with Alexander the Great, if the latter, after the conquest of Asia, had turned his arms against Europe.

PIST, an appellation derived from pappus, 'the pope,' and which denotes a follower of the Roman church. That church calls itself catholic, which means 'universal'; but as other Christian churches also style themselves 'catholic,' a distinction is required to be made. The ecclesiastic Roman Catholic is generally used all over Europe to denote a follower of the church of Rome, in contradistinction to the followers of other Christian communions: but in Great Britain the words Papist and Romanist have been so long in common use, and the former term is particularly employed in vulgar language, with a certain degree of prejudice and obloquy attached to it. The origin of the word 'pappus' is given under Pappus.

PAPPUS, ALEXANDRINUS, a eminent mathematician of Alexandria, who flourished about the end of the fourth century of our era. In the very brief accounts we have of him, he is mentioned as the author of several treatises, all of which, except his Mathematical Collections (Μαθηματικακί πων), probably the most valuable of his writings, appear to have perished. This work, as its name imports, is miscellaneous; and besides a variety of propositions, both problems and theorems, contains some curious general remarks on several branches of science, and the writings of mathematicians in his own and preceding times. Of the eight books of the Mathematical Collections, the first and about one half of the second are presumed to be lost: the rest have reached the present time, though with many imperfections, and in some cases so mutilated that the meaning cannot be certainly determined. The origin, Greek, except some short extracts, has never been printed, and the only translation of it, which is by Commandine, was first published at Pisa in 1588; and another edition appeared at Bologna. This translation is accompanied with a commentary, often tedious, and in some places defective; but at the same time it is extremely valuable, from the explanation which it contains of some difficulties, and the correction of many errors in the textpent used by Commandine, and which pervade all the manuscripts of Pappus that have hitherto been examined. From Commandine's manner of referring to the Greek, it appears that he had only a manuscript for his guide. He died before the work had been completed, and another commentator, a learned history or character of the manuscript which he followed.

In a family dispute between two sons-in-law, the publication was suspended for some time after his death; and at length, by the munificence of his patron, the Duke of Urbino, the translation was printed in 1615. A translation was printed and published in 1684, with a commentary which corrected the errors or omissions in the unfinished work of Commandine. In this state however it was a very interesting communication to the mathematicians of that age, and almost immediately excited the greatest interest and attention towards Pappus.

The first two books of Pappus are not in Commandine's translation, from their not being found in any of the MSS. to which he had access; but a portion of the second book was afterwards found in a MS. in the Savilian Library at Oxford, and a copy is now preserved in the Bodleian. The translation was printed in 1635 with an additional commentary, and valuable notes explanatory of the Greek arithmetic. From this remaining fragment, it is reasonably conjectured by Dr. Wallis that these two books related solely to that arithmetic; and thence he infers that he lost not greatly to be lamented: the whole object of the second book appears to be equivalent to what is considered as a very simple proposition, viz. that the application of any numbers, all or any of which have any annexed, may be performed by multiplying these numbers together, and then adding and subtracting the product. The first book was more employed about the simple operations of the addition and subtraction of numbers. The third book contains geometrical propositions both linear and solid. The fourth contains theorems of pisa, solid, and linear classes of propositions. The fifth is principally of isoperimetrical figures. The sixth is employed chiefly in explaining and correcting some propositions of Theodosius and some other ancient writers, in treates on spheres. The seventh book is entirely on the astrolabium and sundial, the eighth and ninth on mechanics; but though a curious document of the state of that branch of science in the time of Pappus, yet, from the great improvement both in the theory and practice of mechanics in modern times, it is comparatively of little use.

(Dr. Traill's Life of Simson: Suidas, in the notice of Pappus, Chronologi Mathematicorum: and Montuette, tom. ii.)

PAPPUS is a peculiar form assumed by the calyx of certain flowers chiefly of the natural order Composite. It is also called the umbel. The calyx in which to grow larger, the calyx of such plants always remains in a rudimentary condition, sometimes being a mere rim, but more frequently expanded into calyces with hairs, or similar processes, which are in most instances imperfect. The flower of the dandelion is a familiar example of pappus in a state of beautiful division resembling feathers.

PAPPU, commonly called New Guinea, is an island of great extent, situated at the junction of the Indian and Pacific Oceans. It is separated by Torres Strait from the northern extremity of Australia; by the Strait of
Gilliwa from the small island of Sallawaty, which lies farther west; and by Dampier's Strait from New Britain, which is 10° 13' S. lat. and 137° 16' E. long., and nearly to the equator. The most southern point, Cape Rodney, is in 10° 3' S. lat. and the most northern point, Cape Good Hope, in 10° 19' S. lat. From west to east it extends between 136° and 146° 30' E. long.; the most western point, 136° 20' E. long., and the most eastern, Cape Rodney, in 146° 30' E. long. Its length, from east-south-east to west-north-west, is nearly 1300 miles. Its width varies between 500 and 18 miles. The main body of the island, east of 135° E. long., constitutes a vast extent that has hitherto been, with a projecting peninsula at its eastern extremity, but between 135° and 137° E. long., a wide and open bay enters deeply into the land. This bay, called Geelvink, or Great Bay, is nearly 200 miles wide at its entrance, in which some islands of considerable extent are situated, and penetrates about 200 miles southward into the body of the island. The southern extremity of this bay is separated from the Molucca Sea by an isthmus only about 18 miles wide. That part of the island which is west of this isthmus greatly resembles in form the islands of Celebes and Golo, consisting of a projecting peninsula and deep inlets. The largest of the inlets is MacCluer's Bay, which is upward of 100 miles long. According to a rough estimate, the surface of the island is 260,000 square miles, or about 53,000 square miles smaller than Java.

The surface and soil of this island are only known so far as they have been seen by navigators who have sailed along the coast. There are few places on which Europeans have landed, and in no place have they penetrated more than a few miles inland. The soil is thin, the rivers are numerous, and there are probably some larger streams in the wider part of the island. In some places the surface is covered with good grass. Along the northern coast the sea is deep enough to be navigated by the largest vessels, and its estuary is navigable for vessels of from 10 to 20 miles from this coast there are numerous islands, which seem to lie in a row, and among which several are of volcanic origin. Dampier noticed three active volcanoes. All along the southern shores, the country west of the isthmus is likewise mountainous, and the coast rather high and rocky, but it does not rise to any considerable elevation on the shores of MacCluer's Bay. The island itself is formed by a chain of high hills. East of the isthmus, as far as Cape Buro (135° E. long. and 4° S. lat.) the mountains advance close to the shore, and the sea can be navigated by large vessels. Cape Buro rises to a great height close to the sea; but east of this promontory the mountains recede farther inland. They are visible from the sea as far east as 138°, along the branches of the Buro river, and from the shore, which shows that they must attain a considerable elevation. Some navigators think that they have observed snow on them. No mountains appear east of 138°. The country between the sea and the mountains, and the whole country east of 138°, is a swampy country, and covered with extensive swamps, but generally occupied by lofty trees. This low coast cannot be approached, as it is lined by a broad belt of mud-banks. At a distance of from six to ten miles the depth of the sea does not exceed four or five fathoms. It is, however, difficult to comprehend in what relation they are placed to the Papus. Forrest states that a Harafara, by receiving an axe or chopping-knife from a Papu, makes his land or his labour subject to a perpetual tax of something, according to agreement. Forrest also states that the Papus is still subject to the tax, but if he breaks it or wears it to the back, the Papu is obliged to give him a new one, or the tax ceases.
has this island been visited by European vessels for that purpose. The Chinese and the inhabitants of the Ceram Lant and Goram Islands appear to carry on a very lucrative trade, the former on the northern and the latter on the southern coast. The Dutch, who have several settlements on the Molucca Islands, and consider Papua as one of their possessions, do permit their countrymen to trade to Papua, for fear of the introduction of firearms and ammunition, in spite of the regulations made to prevent it; but they give permission to the Chinese to trade on the northern coast.

The Chinese import into Papua iron tools, especially of the smelting kind, axes, blue beads, plates, basins of China and other similar articles, and take in return, slaves, ambergris, trepang, tortoise-shell, small pearls, black loories, large red loories, birds of Paradise, and many kinds of birds which the Papuans have a particular regard for. But the most precious article of commerce is a bark called masooy bark, which is taken to Japan, where the powder made of it is extensively used for rubbing the body. In Japan a peul of this bark fetches thirty dollars. The harbour of Dory, near the western side of the Bay of Goram, is the most beautiful; and the most thriving commerce with Papuas is now established. It is supposed that the decided animosity with which the Papuans commonly receive Europeans is chiefly to be ascribed to the notions instilled into them by these traders, who also use every artifice to impress on them the inferiority of the European civilization. The Celebes and against the Chinese, fearing these two nations as rivals in their commercial transactions. This commerce seems to be very extensive, as it is stated that one village or town on the island of Goram, called Enekka, sends twelve vessels to trade with Papuas.

The Bay of Lokayoe, Onie, and Karrats-Quey: the locality of the two last-mentioned places is unknown. The exports consist of masooy-bark, nutmegs, pearls, trepang, edible birds' nest, fish-oil, wax, and several other valuable articles. Kolff, who gives this list, does not mention the articles of import, of which however cotton cloth and iron seem to be the most important; but he adds that one can hardly imagine what quantities of these articles are annually exported by these islanders, and the returns sent to Bali or Singapoor, or sold to the Chinese settled on the Moluccas. It seems that his report of this extensive traffic has been the principal inducement to the Dutch government for founding a colony on this coast.

During the last war between the Dutch and the Portuguese discovered the western part of Papua soon after they had settled in the Moluccas, between 1512 and 1530. The Spaniard saavedra visited it in 1528. Several other navigators discovered other parts of the coast. Our countryman Dampier discovered the strait which is now called Dampier Strait and Mandona, and sailed along the whole extent of its northern coast. In 1799 Maccluer surveyed the bay which bears his name; and in 1802 Flinders examined the country adjacent to Torres Strait, which was discovered by the Spaniard Torres in 1606. In modern times Kolff, a Dutchman, has discovered and surveyed the south-western coast; and, as already observed, on his report respecting the advantageous trade which may be carried on with this island, the Dutch government founded a colony, and erected, in 1828, a small fortress on a spacious bay, which is called Onoe Fort, and also a town of Dutch, Tritons Bay. The fortress, which is called Dubus, is situated in 24° 42' S. lat. and 133° 15' E. long. (Forrest's Voyage to New Guinea and the Moluccas; Leyden: in Atlas van Nederlandsch-Indie, vol. xii.; Delano's Voyages and Travels; Kolff's Reizen door het Zeelijck Behouden Zuidelijk Molukken Archipel en langs de Geheel Onbekende Zuidoost Kust van Nieuw Guinea; and Molera's Verhaal van eenige Reize naar en langs de Zuidelijken West Indie, Amsterdam gedaan in 1788; PAPYRUS, in botany, is a Cyperaceous aquatic plant, whose soft cellular flower-stem afforded the most ancient material from which paper was prepared. It has a stem from three to six feet high, with three acute angles, one of which is always directed more or less towards the current of the stream in which it grows, as if to break its force. Its leaves are long and grassy, with a sharp keel. The flowers, which are green, are produced in very large compound umbels, with extremely numerous drooping triangular slender radii, terminated by very long filiform involutional leaves, within which are placed the spikes of flowers, each consisting of from six to thirteen florets. It is usually regarded as a species of Cyperus, and is called C. Papyrus; by the botanists it is considered a distinct genus, and is called Papyrum. It is a native of Arabia, India, Abyssinia, Egypt, and Syria, and is also met with in Algeria and Sicily; in gardens it is not uncommon. It inhabits both stagnant waters and running streams, and, independent of its ancient employment in the fabrication of paper, has been applied to the manufacture of carpets, tobacco being twisted into ropes; the roots are sweet, and have been employed as food. In Abyssinia boats are constructed from it, according to Bruce. In Syria the plant is called Badeen. PAPYRUS is not only the name of the plant, but also of the material which is used to be derived from it for writing upon; and the written scrolls made of that material which have been found in various countries are called papyri. The antients employed for this purpose the thin concentric ovals or strips bound together, the most convenient of which were selected by a slight examination. The Egyptians employed the papyrus, the Greeks the parchment, the Romans the vellum. The Papyri are sometimes carried on in several lines; the text of each line is written in a different column, and the lines of each column are written in a different direction. The Papyri, being written in a different direction, are divided by a long line that separates them; and the columns of the lines are divided by a perpendicular line. The form of the strokes of many of the characters shows clearly that the manuscripts were written from right to left. The last line of a page, when it is a complete line, terminates in such a way as to show that it commenced at the right side. Where a phrase or period is found at the end of a line, or the beginning of a column, the line is cut off by a parallel line which is raised above the column, and it is found at the top of the next column. The Papyri are thus divided into columns or paragraphs, and it is certain that in such cases this is the custom of the incomplete phrase or period, because the two parts (that at the bottom of one page, and that at the top of the next page) occur in other papyri in one continuous series. The same characters are also frequently ascertained in the commencement of the different pages, and the initials are very often written in red ink. Sometimes the first lines of the pages are exactly the same. (The British Museum: Egyptian Department, Knowledge.) A framed papyrus (No. 16) in the Egyptian room of the British Museum is a good specimen of the way of writing.

Besides the papyrus written in the enchorial or common language, there was another language, in which the enchorial characters, and these are generally divided by three lines into narrow columns of one inch or less in breadth, in which the symbols are placed one under another, and the columns are arranged from right to left, as in the enchorial writing. Many papyri written in Greek have also been found in Egypt, some of which are interesting as being the oldest written records of any language that is understood at present. The Greek papyrus of Mr. Grey, now in the British Museum, is probably of B.C. 135, and contains the translation of a deed of sale, the text of which, in enchorial characters, is on a papyrus at Paris; and another copy, likewise in enchorial writing, digitalized by Google.
The name for paper in the Spanish, French, German, and English languages is derived from that of papyrus, whilst the Italian has retained the Latin word 'charta,' which was used for parchments and other materials for writing.

PAR OF EXCHANGE. [EXCHANGE]

PARA, or, with its full title, Santa Maria de Bolem de Gram Pará, is a town in Brazil, in 1° 18' S. lat. and 48° 22' W. long. It is built on the bank of a wide river, which is formed by the confluence of the river Tocantins with the Tapirupiru, or southern arm of the Amazonas, and is called Rio do Pará. Opposite the town the river is about seven miles wide, and this may be considered as its average distance. The water is of a clean and transparent quality, and is accordingly rather difficult and tedious. On the south side of the town is the Rio Guama, a considerable stream, which joins the Rio do Pará by a western course. The streets of Pará are wide and straight, and intersect one another at right angles. The buildings are of stone, but not high, consisting rarely of more than two storeys and frequently of only one. They are white-washed, and frequently without glass windows. The cathedral is a large and tolerably noble structure. The best edifice in the town is the College of the Jesuits, the residence of the bishop of Pará: a part of the building is occupied by the college, in which young persons study divinity. The church contiguous to the college has been converted into a hospital. The palace of the governor and the custom-house are also fine buildings.

In 1820 the population was estimated at 24,500, and it has probably increased since that time. It consists of a considerable number of creoles and a larger number of negroes being of more than in proportion than in other seaports of Brazil. The Indians are occupied as menial servants, fisher-men, boatmen, and porters, but they do not exercise trades.

The commerce of Pará is considerable and increasing. The exports consist of rice, indigo, cedars, and other forest products, cotton, vanilla, copaiba, pitch, copal, fusife, timber, wood for cabinet-work, tobacco, ropes made from the fibres of palm-trees, sarsaparilla, rice, mandioc, starch, Indian-rubber, pechurin-beans, tonquin-beans, tamarinds, Cassia caryphyllace, and indigo, arrowroot, and other chief products. In 1799 the natives had the advantage of Paspal II. in favour of that archiepiscopal see.

The Egyptian papyrus found in the swathing of mummies are often in a good state of preservation, but require great care in handling and unrolling them, being about the thickness of a sheet of paper. One of the most ancient names given to this plant is that of the Erythraeans, who called it 'Hesperus,' from the region where it grows, and the name 'Papyrus' is still retained. The genus is a large one, and includes many species, among which the most common are Papyrus typhon, Papyrus nitens, Papyrus brasiliensis, and Papyrus cembro, all of which are native to Brazil.

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The papyrus reed has become scarce in Egypt; but it is described as still existing about the lake Menelch, near Damiat. There is a Sicilian water-plant resembling the papyrus, which is found in the Anapaus near Syrcusae, from which some samples of paper have been manufactured in front years, according to the ancient method for preparing papyrus, which is described by Pliny (xiii. 11, 12).

PARABLE (φασχμα, a comparison or similitude) is defined by Bishop Lowth as 'a continued narrative of a fictitious event, applied by way of simile to the illustration of some important truth.' (Proleg., x.) It is a species of fable, and differs from the apocrypha or narrative events which, though fictitious, are not impossible to have
1. Let a point $P$ move in such a way that its distance $SP$ from a fixed point $S$ is always the same as its perpendicular distance $PM$ from a given line $ML$. This point $P$ describes what is called a parabola.

2. The line $LS$, perpendicular to $LM$, produced, is the axis, or principal diameter; and any line $PV$ parallel to it is called a diameter. The point $S$ is the focus, and the line $LM$ the directrix. The ordinate $SK$ drawn through the focus is called the semi-latus rectum, and double of it is the latus rectum. The same phrase is used for the ordinate drawn through the focus of an ellipse or hyperbola.

3. $SA$ is equal to $AL$, and $SK$ to twice $AS$.

4. If an ellipse be described with the vertex $A$ and the focus $S$, the farther the centre is from the point $S$, the more nearly will the part of the ellipse which falls within a given ordinate $PN$ coincide with the corresponding part of the parabola: and the same of an hyperbola drawn with the vertex $A$ and focus $S$. And a parabola may be considered as an ellipse or hyperbola with a given focal distance $AS$, and a centre at an infinite distance.

5. The tangent $PT$ bisects the angle $MPS$, and $SP$ is equal to $ST$, and $AN$ to $AT$. The line $SY$ drawn perpendicular to the tangent from the focus always meets $PT$ in a point of the tangent drawn through $A$.

6. If $PG$ be drawn perpendicular to $PT$, then $SP$ is equal to $SG$, and $NG$ is always equal to twice $AS$.

7. The square on $PN$ is equal to four times the rectangle under $SP$ and $PV$.

8. The area $ANP$ is two-thirds of $NZ$, the rectangle under $AN$ and $NP$.

9. If $QQ'$ be drawn parallel to $PT$ through any point $V$ of the diameter $PV$, $QQ'$ is bisected in $V$, and the square on $QQ'$ is equal to four times the rectangle under $SP$ and $PV$.

10. The square on $SY$ is equal to the rectangle under $AS$ and $SP$.

In applied mathematics, the parabola was formerly of great importance, both as being the curve in which a comet was supposed to move, and as that in which a cannon-ball or other projectile would move were it not for the resistance of the air. It is still sometimes used as the approximation to the elongated ellipse in which a comet moves. For the modern use, see the investigations which deduce the real path of a projectile, see GUNNERY.

PARABOLOID. The simplest form of this surface is the paraboloid of revolution, made by the revolution of a parabola about its axis. For the other meanings of the term, see SURFACES OF THE SECOND DEGREE.

PARACELSUS, the name commonly given to a very extraordinary person, who called himself by the compound and high-sounding appellation PHILIPPUS ADRIANUS THEOPHRASTUS PARACELSUS BOMBAST, or Hohenheim: to which he sometimes added the epithet Eremus. Of all these names it is difficult to say which, if any, really belonged to him; for though he seems to have liked Theophrastus better than any of the others, and sometimes (as in his will and his letter to Ermanna) called himself by that name, yet, as he tells us, he says, in his book called Parapromotographion, "Et Natura et Baptismatis jure Theophrastum nominor," still he was wont to pay so little regard to truth, either in his words or actions, that he cannot safely be believed even in such a trifle as this. The place of his birth is equally uncertain, though he is generally supposed to have been born in 1493, at Einsiedeln in the canton of Schwyz, the Latin name of which, "Helvetia Eremus," caused him to be sometimes called "Eremita." (See however Haller, Biblioth. Medec. Practom. ii.) His father was a physician, and instructed him in algebra, geometry, and medicine; but when he had been educated, and he confesses himself that he was not fond of books and had a horror of languages, insomuch that at one time he did not open a book for ten years together. This is quite confirmed by the internal testimony of his writings, which are as unintelligible from their style as their substance. He soon commenced a wandering life, and spent some years in travelling over almost all Europe and probably several parts of Asia and Africa. He had a most ardent desire for information of all sorts, and neglected no opportunity of obtaining it; but he appears to have been little judicious in the choice of his informants, and to have consulted conjurors, old women, and quacks of every description, quite as much as physicians and philosophers.

The most valuable acquisition that he made in his travels was an acquaintance with metallic chemistry, by means of which he was enabled to perform several wonderful cures, and thereby laid the foundation of his fame. In 1526 he was chosen to be professor of medicine and natural philosophy at Basel, and commenced his course of lectures by lighting the whole of the library in a brazen chafing-dish, and then threw into the flame the works of Galen and Avicenna, exclaiming, "Sic vos ardebitis in gehennam." He lectured partly in Latin and partly in German, which, together with his singular manners and the novelty of his opinions, rendered him extremely popular. In his correspondence with the magistrates about the amount of a fee which he demanded of one of the canons, he left Basel in about a year, and recommenced his wandering life. He seldom stayed long in one place, but lived chiefly in taverns, where he generally took off his clothes by day. It is said, though he had hitherto lived a very temperate life, and taken nothing but water, he now spent whole nights in drinking with the lowest company. He still maintained his reputation by occasionally effecting some extraordinary cures; and his powerful predictions, but his failures were equally conspicuous. At last, after passing through many vicissitudes, the boasted possessor of the philosopher's stone and the elixir of life died in great poverty in 1541, at Saxburg, in the Tyrol, at the early age of forty-eight.

As might be expected, Paracelsus has been as much execrated as despised and abused by his
enemies. With respect to his moral and religious character, there seems to have been some reason for admiring: he was totally destitute of piety, and his theological theories (as far as they can be called such) were a confused mixture of infidelity, heresy, and absurdity: in gluttony and drunkenness, in lying and charlatanism, in vanity and arrogance, he has been celestial illustreters and charlatans. If any one is disposed to think this judgment of him too hard, he will but find it abundantly confirmed by the passages quoted from his own writings and those of his personal acquaintances by Le Clerc, in the Appendix to his 'Hist. de la Méd.' His intellectual talents and acquirements are not much more deserving of respect; but in order to estimate these fully, he must be considered — 1, as a chemist; 2, as a physician; and 3, as a philosopher. 1. As a chemist (though probably the ablest of his time), he fails far short of his predecessor Basil Valentinus, whose 'Ess. Chem. Pract.' were published in Latin at Frankfurt, 1603, in 10 vols., and of which a complete list is given by Haller, in his 'Bibl. Theol. Med.' 2. As a physician, in his 'Manual of Chemistry,' are few and unimportant, and his great merit lies in the boldness and assiduity which he displayed in introducing chemical preparations into the Materia Medica, and in subduing the prejudices of the Galenic physicians against the productions of the laboratory. But though we can fix upon no particular discovery on which to found his merits as a chemist, and though his writings are deficient in the acumen and knowledge displayed by several of his contemporaries and immediate successors, it is evident that his writings on thermometers, thermometrical instruments, and on the maeutical chemistry, and calomel, with a variety of medicinal and antiemotional preparations, as likewise opium, came into general use. He pretended (as was hinted above) to possess the secret of the philosopher's stone and the elixir of the gods. In his various publications he used not a few pompous names, such as the 'Quintessence,' the 'Arabam of Vietri,' the 'Azoth,' &c.: the composition of his 'Laduaram' he is supposed never to have revealed, and in the short dictionary at the end of his works we are merely told that it 'tends to augur signs, ex dubious tanta rebus constans, quibus excellissent in mundo reperiri nequitiant, quid mortem omnes cerebret.' 2. As a physician he cannot lay claim to any scientific skill; and though his epistles declare that 'Leibniz,' with the help of 'Chu Reing' and some directi (to which we are not told), he was able to cure 'every man of his patients, or at least made them worse than they were before.' (Libavius, Hist. Pneum. Amalcul., quoted by Le Clerc.) His medical writings are full of either of credulity or imposture. He says that it is possible for a man alone to create a living child resembling in every respect those born of women, only much smaller, and he gives directions for doing so, too absurd and indecent to be quoted. He explains minutely the anatomy which he supposed to be capable of the air in the universe. He makes the world, and the Microcosmus, or human body, and says that every physician ought to be able to point out in man the east and west, the signs of the zodiac, &c. (Paragranum, Tract. 2.) He says that the human body consists of nothing but sulphur, mercury, and salt. (Pararamum, lib. 1.) He professes his belief in magic (though in this he was not more credulous than his contemporaries), and boasts of having received letters from Galen, and of having disputed with Avicenna in the vestibule of the infernal regions. (Paragranum, Prof. 6.) Some of his curious remarks were cases of syphilis and other obstinate ulcers, and his 'Chirurgia Magna' and 'Chirurgia Minor' have been more esteemed than perhaps any of his other works. In extracting an arrow or other weapon from a wound, he recommends (when all other means fail) that you should use twenty-two feet of any sort of meat, and infallibly succeed. 3. With respect to his philosophical (or metaphysical) opinions, it is very difficult to discover what they were, not only from the great obscurity of the subject-matter of his works, but also from the new words that he introduced, and which can only be understood by making some sense of them. He putns upon those in common use. Ilidius, Blaster, Idectrum, Domor, Cagastrum, Evester, Trarames, Dzaleuch, &c., are some of those invented by himself, and of which no intelligible explanation is to be found. He is supposed to have used an argument against the cabalist writers, whom he endeavoured to render popular, and expounded with a lively imagination. Among his principal mystic notions were those of an internal illumination, an emanation from the Divinity, the universal harmony of all things, the influence of the stars on the sublunar world, and the vitality of the elements, which he regarded as spirits encased in the visible bodies presented to our senses. These are, says Hallam ('Lit. of Europe') the divinities (syphilitic spirits) of the ancients, and of the modern magicians and alchemists. It is thus observable that he first gave these names, which rendered afterwards the Rosicrucian fables so celebrated. These live with man, and sometimes (except in the hands of charlatans) bear children to him: they know future events and reveal them to him; they sleep and wake; they have hidden treasures, which may be obtained by their means. The writer may apologise in Hallam's words, and confess that he may perhaps have said too much about paradoxes so absurd and mendacious; but literature is a garden of weeds as well as of flowers, and Paracelsus forms with the history of opinion which should not be overlooked.' His works, part of which are written in German and part in Latin, and of which a complete list is given by Haller, in his 'Bibl. Theol. Med.' 1589-90, also in 10 vols. 4to. For more particulars respecting Paracelsus and his opinions, see Le Clerc, Hist. de la Mél.; Spengel, Hist. de la Mél.; Brucker, Hist. Crit. Philosoph.; Kaiser and Sieber, Leben und Lehremeine berühmter Physiker, 1st. 1.1. PARAENTRIC, or 'towards the centre,' a term sometimes used, as in paracentric velocity, which means the rate at which a moving body approaches a certain centre without reference to the radius of curvature of the path in space. PARACEPHALOPHORA, M. de la Boule's name for his second class of Malacostraca, which is divided by him into the subclasses Paraccephalopora dioica, Paracephalopora monica, and Paraccephalopora hermaphrodita. (Malacostraca.) PARACHUTE, a French word, signifying a means of preventing a fall. The first part of the word, para, is perhaps of Greek origin; the second part is the French word chute, a fall, which is of Latin origin. A parachute is a machine attached to a balloon, and is intended to convey the occupants gently to the earth, in case of an accident happening to the balloon. It is in shape like an umbrella, and its construction may be understood by supposing the umbrella to be large and strong; to be provided with a central stem or stay fastened to the extremities of the whalebones, and brought down to the ground by the wind, and that the must be fixed, so as to prevent the umbrella from turning inside outwards. Instead of the stick, suppose a metal tube to be fixed in the centre, with a rope passing through it, attached by its upper end to the balloon and by its lower end to a tub or car. This machine is a parachute, while ascending, it will be like a closed umbrella, but it may at any moment be detached from the balloon by cutting the end of the rope which is tied to the car; the resistance of the wind will act on the tub, and will at the same time retard the velocity of descent. The idea of using such a machine to break the fall from a high place is not new. Nearly two centuries ago De la Loubere relates that a man was in the habit of amusing the court of Siang by descending from a considerable height with such a contrivance. He used two umbrellas, fastened by long slender handles to a girdle tied round his waist; 'le vent le portoit au hazard, tantost a terre, tantost aux arbres, ou sur les maisons, et tantost dans la riviere' (vol. 1, p. 145, Amsterdam, 1691). The experiment was repeated in France in 1753, by M. le Normand, who leaped safely from the window of a house with a stout umbrella in his hand of thirty inches in diameter. The descent from a balloon was first tried on a dog by Blanchard, at Strasbourg, in August, 1787. The dog was lifted to a height of a mile, and the ascent far greater than a mile, and he reached the ground in safety. Blanchard was less fortunate in a subsequent experiment on his own person at Basle, where he broke his leg by too rapid a descent. Garnier was the next adventurer; in January, 1797, though the parachute oscillated a good deal. On the 4th of September, 1802, Garnier made a second descent, which was less successful than his first; he left St. George's Parade, North Audley Street, in a parachute thirty feet in diameter (one account says twenty-two) and was down in eight minutes to a height estimated at 8000 feet, and then cut the rope which attached him to the balloon. Unfortunately the parachute remained closed, and for a few moments its motion was frightfully rapid; but at length it burst open with some violence, and the descent became gradual; the shock however had caused such an oscillation in the machine
that it appeared to the spectators to be at times quite horizontal. But the vibration diminished as the parachute nearied the ground, and Garnerin nighted safe in a field near the Small-pox Hospital in St. Pancras. But although safe, he was unable to speak, blood issued from his ears and nose, and he was in a state of great agitation; he had thereceived a severe shock from the first rapid descent, and its sudden cessation; but the consequences were less serious than might have been anticipated, and he was well enough in a few minutes to address the crowds assembled to witness the attempt; the same shock had broken one of the stays, and this probably was partly the cause of the great oscillation. We are not aware that Garnerin ever repeated the experiment, but the writer of this notice has 1816 twice witnessed the descent of Miss Garnerin, his daughter, from great heights, his car turned upside down, there would be no disturbance in its descent. He therefore made one in this form. The diameter was thirty-four feet, and as it would have a tendency to close in its descent, he endeavored to prevent this by putting a heavy wooden hoop around it; it had also a hole in the middle six feet in diameter. The balloon to which this ponderous machine was attached was lent on Vauxhall Gardens on the 24th of July, 1837, and the consequence was what might have been anticipated. As soon as the parachute was cut away, it fell with rapidity; its vibrations were violent, the large hoop broke, and Cocking fell, dreadfully mutilated, at Lee near Blackheath, about six miles from the scene of his ascent. The result had nearly been equally fatal to the persons in the car of the balloon: the sudden liberation of the parachute caused such a rapid ascent that the gas was forced down, and for great rapidity, and for nearly five minutes they were so completely enveloped with it that for a time they were deprived of sight and suffered great pain. Most luckily they had provisions in a large bag full of atmospheric air and furnished with two metal tubes; they were thus enabled to breathe; without such a precaution suffocation would have been inevitable.

Three formulas have been given for calculating the velocity of descent of a parachute. They are:-

$$26 \sqrt{\frac{2g}{c}} = v$$
$$28 \sqrt{\frac{2g}{c}} = v$$
$$30 \sqrt{\frac{2g}{c}} = v$$

in which $w$ is the weight in pounds avoirdupois; $d$, the diameter of the parachute; $v$, the number of feet per second.

According to the first of these, if a parachute be 50 feet in diameter and weigh 209 lbs., it will fall at 396 feet in a second; according to the second, the fall will be 133 01 feet; according to the third, 131 01 feet: the truth may lie between.

In the three cases, the shock felt on landing would be nearly equal to that caused by a leap from heights between

$$10^5 \gamma \text{ to } 12^4 \gamma$$

190 ft., being, under the given circumstances, something less than 2 feet 3 inches, 2 feet 8 inches, and 3 feet 7 inches.

PARACYANOGEN. When cyanogen is obtained by heating benzol of mercury in a retort, there remains in it the cyanogen, which was stated by Johnston to be similar in composition to cyanogen, that is, composed of 2 equivalents of carbon 12, and 1 equivalent of azote 14 = 26. It appears therefore that the cyanogen, benzoic cyanogen, but differing from it in great elevations; in other words, and paracyanogen being sold and cyanogen gasous in its form.

This compound is also formed when mercury is kept in an alcoholic solution of cyanogen

Paracyanogen is soluble in sulphure and nitric acid, and forms a compound in which an equivalent of oxygen is combined with 6 equivalents of carbon and 4 equivalents of azote: it is therefore probably composed of these proportions of the last-named elements.

PARADISE (pe`da-`zie) is a word of Persian origin, signifying a kind of marsh or pleasure-ground enclosed with walls, and well watered and planted, and stocked with animals for the chase. (Pollux, ix. 13; Gellius, ii. 19.) It was adopted into the Greek language, and applied to any pleasant place. The Septuagint translators use this word for THE, the garden of Eden, where God placed the first man upon his creation. (Gen. ii. 8; iii. 23.) Respecting the situation of this place we are told, in Gen. ii. 8-14, that it lay eastward in the land of Eden, and that it was watered by the Euphrates. At various times the garden, divided into four streams, of which the first, Pison, compassed the land of Havilah, where there was gold, and bediinum (whether the pearl or a sort of gum resin), and the onyx stone; the second, Gihon, compassed the land of Cush; the third, the Euphrates and the Tigris; and it divided into two other places where it left the garden at the south, namely, the two mouths of the river formed by the union of the Euphrates and Tigris, now the Shat al Arab. On the hypothesis of the escaped from the heaven, the antient Susians, or Kassians, and Havilah to the neighbouring part of Arabia, which in antient times did produce gold, and in which Strabo places a people called Xenarvones (xvi. 767). Eden would then stand near the modern Korns, at the confluence of the Tigris and Euphrates. This opinion, which is the most generally received, has been objected that it uses the word Cush in a sense not supported by the other passages of Scripture in which that name occurs; that it is not clear that the Shat al Arab had antiently two mouths, and that if it had, such streams would not be spoken of as rivers of the same class as the Euphrates and Tigris; and lastly, that the interpretation put upon the words of Gen. ii. 8, is not a natural one.

Another theory places Paradise in the neighbourhood of Babylon, and finds the Pison and Gihon in two of the canals of the city.

Reland and Calmet place Eden in the high lands of Armenia, considering that the text (Gen. ii. 8) points to a position near the sources of the four rivers. They make the Pison the Phasis, the Gihon the Araxes (which is still gardend and fruitfulness the land of Eden), and the Cush the country of the Cossæi (Strabo, xi. 322; xii. 744; Diod, Sic. xiii. 111). The opinion of Michaelis is only slightly different from this; he takes the Gihon to be the Oxus. The Phasis of the antients however rose not in Armenia, but in Cogheia.

Some writers suppose that the deluge has so altered the physical features of Asia, that it is in vain to search for any place answering to the description given in Genesis. But any one must perceive that the author of that book could not have imagined any such a country as mentioned by him, given the position of Paradise, if some spot corresponding to his description did not exist on the face of the earth when he wrote. It must be admitted however that all the attempts hitherto made to discover the true position of the place are perfectly unsatisfactory.

(Winer's 'Biblioth. Reale cistericorum,' art. 'Eden'; E. F. C. Rosenmüller's 'Handb. der Bibl. Alterthumk., t. i. p. 172; s. c. &c.)

Paradise, in the New Testament, is used for the abode of the departed spirits of the good between death and the resurrection.


PARADISEA (par-a-diz'-e-a). [Bird of Paradise].

PARADISI, COUNT AGOSTINO, was the great neophyte of the Agostino Paradisi, author of the 'Ateo del Corno mobile.' He was born at Vignola, in the territory of
the Pará, which separates it from the Brazilian province of S. Paulo, and from the state of Corrientes, which is a part of the republic of La Plata. On the north it borders on the Brazilian province of Matto Grosso, and in this part the boundary-line runs partly along the range of the great mountain ranges of Guaicurus, and no settlements of whites have been formed either on the side of Brazil or of Paraguay.

Surface and Soil.—The northern part of the country is mountainous. From the Sierra Seíada, one of the mountain ranges which traverse the middle of Brazil from east to west, and on that range itself near 55° 30' long. and 17° S. lat. This branch runs for some distance south of the Pará, and then south, dividing the tributaries of the Pará, which run east, from those of the Paraguay, which run west. This range is called Sierra Amambaby, and under that name it enters Paraguay, and in a southern direction to the vicinity of 24° S. lat., where it turns eastward and terminates on the banks of the Rio Paraguay, opposite the Salto Grande de Sette Quedas. [BRAZIL.] This range is called Sierra Maracaú, where it runs south and east. The length of this range from the north of the Pará to the east and north of this range is little known, as it is possessed by native tribes, and only occasionally visited by whites. It seems to have a very broken surface, exhibiting a succession of valleys and ranges of high hills, all covered with forest, and also with cut and level surfaces, full of rapids and cataracts. The country west of the Sierra Amambaby seems to be less mountainous, but has likewise a broken surface, and its rivers run with great velocity, though their course is less interrupted by rapids. The Paraguay is in general full of rapids; but hitherto the whites have not settled in this part. Thus it may be said that one half of the countries included within the boundary of Paraguay, properly speaking, do not belong to it.

The remainder, or that part which is situated south of 24° S. lat., is one of the most fertile and most pleasant countries of South America. The greater part of the surface is a succession of hills and gently sloping eminences, and broad open valleys intersected here and there with lakes. The lower grounds and plains are in some tracts savannas, and afford excellent pasture-ground; single palm-trees are dispersed over them. The hills and slopes however are wooded from the top to the bottom, and frequently with stately forests. The vigorous vegetation is the great fertility of the soil, which is unmis-

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Ragno, April 24th, 1736, and was educated at the Collegio Nazareno at Rome, on returning from which he prosecuted his studies diligently, and among the rest, applied himself to that of English literature. His talent for poetry displayed itself at an early age, and when only sixteen he was invited to the famous ambassady at Rome, and shared at his instance of his dramatic compositions. On the death of the Abbé Salandrì, in 1777, Count Firmian, the Austrian miniature painted, invited Paradisi to accept the office of perpetual secretary in the academy of Mannus; but the duke of Modena appointed him professor of eloquence and literature on belles-lettres in the university of that city; and afterwards (1776) bestowed on him the title of count. During the eight years that filled that chair, his lectures obtained for him the applause not only of his own countrymen, but of many foreigners, an honouring 12 paradoxes instead of contradiction, where he held a distinguished civil employment, devoting his leisure to literary pursuits; but his health now began to decline, and he was attacked with dropsy in the chest, which disorder carried him off, February 19th, 1783, in the 56th year of his age.

Besides his 'versi scolici,' or poems in blank verse, which are esteemed both for their elegance of style and their moral value, he published three volumes of tragedies, translated from the French, including an original one entitled 'Sagaco; or the false forest-tree.' Every fool on Montecuccoli is considered a masterpiece of its kind. His 'Saggio sopra l'Entusiasmo nelle Belle Arti,' shows his ability as a philosophical critic; while his knowledge of jurisprudence and civil economy is displayed in his 'Parere Economico,' which is also well written. [C. T.]

PAR'ADOX (from παράδοξος, 'contrary to received opinion') is a term applied to a proposition which is opposed to the general belief, or to one which appears at first sight to contradict some previously ascertained truth. The nature of a paradox and the distinction between it and a contradiction is clearly explained in the following sentence from Bishop Horsley's 19th Sermon: 'When two distinct propositions are separately proved, each by its proper evidence, it is not a reason for denying either, that the human mind, upon the first bashy view, imagines a repugnance, and may perhaps find a difficulty in connecting them, even after the distinct proof of each is clearly perceived and understood. There is a wide difference between a paradox and a contradiction; the one is a collection of two or more propositions, and so far only are they alike; for in the true paradox, the one or the other must necessarily be false; of a paradox, both are often true, and yet, when proved to be true, may continue paradoxical. This is the necessary condition of a paradox; for every one to which nothing should be paradoxical would be infinite. In all these cases there is generally in the nature of things a limit to each of the two contrasted propositions, beyond which neither can be extended without implying the falsehood of one or both, and a contradiction is the limit of the truth of both. It is evident that the proposition: 5. The wise man alone is free, and every fool is a slave. 6. The wise man alone is rich.
sels several hundred miles within the boundary of Brazil. The Paraná, which runs along the eastern side of the country, is much less favourable to navigation. The great cataract, called Salto de Sette Quedas, near 24° S. lat. [Brazil. v. 357], forms an insuperable impediment to navigation. Fruit-trees abound on the banks of some of the rivers which pass through the Paraná provinces, where the river descends in long rapids over rocky shoals; the last cataract occurs at the island of Aripé, where the river runs westward to its junction with the Paraguay. Vessels of 300 tons burthen ascend to this island to take up trade. The course of the small rivers which run into the Paraguay, are navigable to a short distance from their junction with it, but one of them, the Tiquibari, is navigable above a hundred miles. It drains the southern portion of the country, and falls into the Paraguay near 26° 30'.

Climate and Productions.—During any one enjoys the advantages of the intertropical rains. The rainy season occurs in the months when the sun is in the southern hemisphere. The rains are far less abundant than nearer the equator, but sufficient to bring the fertility of the soil into full action. No meteorological observations have been published or general the climate is said to be pleasant, and the heat rarely oppressive. The country is healthy, except the swampy tracts already noticed.

The principal articles cultivated as food are maize, batatas, maize, manioc, bananas, and beans. The cultivation of the sugar-cane, tobacco, and cotton is rather extensive. The principal fruit-trees are oranges and figs. With the exception of the yucca-root, the vegetables are bad, and consist chiefly of potatoes, turkeys, and garlic. Water-melons and musk-melons are abundant and good.

Paraguay possesses great wealth in its forests, which contain numerous species of lofty timber-trees, and dyewoods for tanning and other purposes. Several of them provide excellent cabinet-wood. All the vessels that navigate the rivers Paraguay and Paraná are built of timber supplied by this country, and the ropes are made of the fibres of different plants which grow there, but it is said that they are soon spoiled by the use. The most prominent of the forest-trees is that which yields the famous bear called mato, or Paraguay tea [Tax, PARAGUAY], and which is extensively used in the southern countries of South America as a beverage. The country which separates the yerbales (or forest-tailed bears) has been inhabited from the Paraguay. It is without cultivation, and covered with thorny trees intersected by marshy grounds.

As Paraguay does not contain such extensive prairies as those which occur in all the surrounding countries, the number of rams and hogs is not equal in their western part, but the wool of the sheep is of good quality. The cotton, sugar, molasses, spirits, &c. As the countries farther south are either entirely destitute of trees or have no timber-trees, the exportation of timber was very considerable, and most of the vessels were built in Paraguay. But in the northern provinces of Paraguay both foreign and native commerce with foreign nations, and even with the neighboring provinces, and he allows no one to leave Paraguay when he has once entered it.

History.—After the Spaniards had discovered the wide stretches of land between the Paraguay and Paranan, they soon perceived that they must be opened by a colony on the banks of the river. But two attempts of this kind failed. The settlements contained only a small number of settlers, who were soon deserted by the warlike natives of the plains. In 1535, the Admiral de Monte Pedro de Ribadeneira founded on both sides of the river Paraguay, above the island of Amig, and succeeded in bringing them to a certain degree of civilization. When the Jesuits were expelled, in 1677, the Missions were inhabited by more than 100,000 civilised Indians, of whom perhaps less than one-fifth continued in the aboriginal form. The other part of the Parana, known as the Paraguay, the region south of the Paraná, and the region west of the Paraguay, refused to acknowledge this government, and defeated General Belgrano, who had been sent to bring Paraguay to obedience. The country soon after declared its independence.
Dector Gaspar Rodriguez de Francia became dictator, and though his measures do not agree with our conceptions of a wise government, he has preserved the country from all the misery which the other South American republics have abundantly experienced in their continual dissensions and civil wars. His policy of excluding all foreigners from the country must contribute greatly to consolidate the different elements of the population into one mass, and to form them into a nation.

(Parish's Buenos Ayres and the Provinces of the Rio de la Plata; Robertson's Letters from Paraguay; Beaumont's Travels in Buenos Ayres.)

PARAGUAY TÉA. [Paraguay.]

PARAIBA, or more correctly PARAHYBA, is a river in Brazil. It drains the littoral region of that country, which extends between lat. 12° and 35° S. lat., and is enclosed on the south by the Serra do Mar, and on the north by the Serra de Montenique and one of its branches called Serra de Frecheira. This river has a comparatively short course, but deserves notice because it drains the country lying to the north of the capital of the Brazilian empire, and is the first important river to be passed in proceeding into the interior of that country. The valley enclosed by the two ranges above mentioned is traversed longitudinally by a ridge of mountains of inferior elevation, called The Serra de Parahyba. The river rises, a few miles inferior ridge is connected with the Serra do Mar, near 44° 30’ W. long., and flows, under the name of Paraibynts, westward, until, after a course of about 100 miles, and near 46° W. long., it turns north-east by a bend forming a very acute angle with the Serra. As the name of the river in the upper part of its course descends in a valley, the slope of which is considerable, the current is too rapid to admit any kind of navigation. From the Aldeia de Escada the river runs east-north-east through a valley enclosed by the Serra de Paraiba on the one side, and the Serras de Montenique and Frecheira on the north, until it falls into the Atlantic about 20 miles north of Cape de S. Thome, near 41° W. long. Its course in this valley extends 400 miles, so that it runs altogether above 500 miles. From the Aldeia de Escada to the small town of S. Fides, a distance of 50 miles, the level part of the valley is some miles wide, and the current of the river rather gentle and regular, and it is accordingly navigated. Lower down however there occur several rapids and falls, as the valley grows narrower and the mountains approach close to the banks of the river. About 20 miles below Loreto, the bed of the river, which has enlarged to the width of half a mile, is contracted to about 10 yards by a long wall of rock on both sides, which is more than 60 feet high and 400 yards long. Farther down it receives the waters of two tributaries, the Rio Piranha, and the Rio Pomba, each of which runs above 100 miles. The last of its numerous falls is that of S. Fides, which is somewhat more than 30 miles from its mouth, and to the base of this cataract large river-boats ascend. The greater part of the river is still in its natural state, being covered with trees of high growth, which more than in any part of Brazil exhibit vigorous vegetation by which the maritime districts of that empire are distinguished. This is chiefly to be attributed to the great moisture of the air in a valley surrounded by mountains, and consequently not exposed to any wind. Cultivation has not yet made great progress, except in the wider portion of the valley, between the Aldeia de Escada and Pendamohangaba, where the Indian corn and mandioca, as well as the indigo, intertropical products, are raised, especially sugar-cane and tobacco, for the cultivation of which the climate and soil seem very favourable. (Spix and Martius, Reise in Brasilien; Henderson's History of Brazil.)

PALLAS, NICOLAI, used in astronomy generally for the angular variation in the position of an object caused by the excentric situation of the observer with respect to a certain point of reference. Thus the parallax of the moon, sun, planets, comets, is the difference between the position of any of those bodies as seen from the surface of the earth and that in which it would be seen if the observer were placed at the earth's centre. The parallax of the fixed stars is the difference between their places as seen from the earth and from the sun, which is for those observations the point of reference. All bodies within them are in the excentric position of the earth's centre; while those beyond our system, as the fixed stars, are referred to the centre of the sun, and the change arising from excentric position in each case is called parallax.

From the effects of parallax we derive all our knowledge

* Some liberties have been taken with Poley's description, and several obvious errors made. He seems to have been totally unacquainted with an observer, for at 50° 0' Appar. Zon. Dist. he found the moon's parallax = 17', whereas the horizontal parallax is 50° 0', and the distance of moon from the earth 30° 0'. He has drawn the latter conclusion, butfortunately escapes not to have used it in his theory.
of the distance and magnitude of the bodies which are visible in the heavens.

Let $AB$ be any line the length of which is accurately measured, and let the angles $ABC, CBA$ be observed, then the distances $CA$ and $CB$ can be computed. In this way trigonometrical surveys are made, with the further precaution that the angle $ACB$ is observed when this is possible, and $C$ is to be fixed with great nicety. The angle $ACB$ is known, since $C = 180\cdot (BAC + ABC)$, and we have $AB \cdot BC \cdot \sin \angle ABC \cdot \sin \angle CBA$. In the above figure, let $A$ be the position of a spectator on the earth's surface, $B$ the centre of the earth, $C$ the moon, and $Z$ in $BA$ produced the geocentric zenith. Then $ZAC$ is the apparent geocentric zenith distance at $A$; $ZBC$ the true geocentric zenith distance, i.e., that which would be seen from the centre of the earth; and $\angle ZAC = ZBC$, the moon's parallax also.

$$\sin \text{parallax} = \frac{AB}{BC} \times \sin \text{Appt. geocent. zen. dist.}$$

When $AC$ is at right angles to $BA$ this sine $= 1$ and the moon is in the horizon. This value of the parallax is called the horizontal parallax; naming this $P$, and any other value of the parallax $p$, we have $\sin \mathbf{P} = \frac{AB}{BC}$ and $\sin p = \sin \mathbf{P} + \sin \text{appt. geocent. zen. dist.}$.

It is evident that if $P$ can be measured, the distance $R$ of the moon's centre from the centre of the earth can be found, for the other quantity $AB$ or $R$ is the radius of the earth at the place of observation, which is known from terrestrial measurement. Now suppose a second spectator on the same meridian at $A'$, whose geocentric zenith is $Z'$, and that the two observers each observe the moon upon the meridian at the same moment: then, if $x$ and $z'$ be two observed geocentric zenith distances, and $p$ and $p'$ the parallaxes, $\frac{BA}{BC} = R = \frac{B'A'}{B'C'}$. and

$$\angle ABC = z - p \quad \angle B'AC = z' - p'$$

and adding $AB(A'z' + z'^2 - (p' - p)^2)$, where $AB/A'$ is the sum or difference of the geocentric latitudes of $A$ and $A'$, and $z$ and $z'$ are known by observation; hence the value of $p' - p$ or $A'C$ is found. From the equations

$$p + p' = x + z' - AB/A'; \quad \sin p = \sin x; \quad \sin p' = \sin z';$$

it is easy to find the value of $R$.

In practice, though the process is less simple, the principle remains the same. Two distant observatories can scarcely be found exactly on the same meridian, but the tables of the parallax will reduce the observation at one of the observatories to exactly what it would have been if it had been made under the meridian of the other. When the parallax is small, it is advisable to compare the planet by the micrometer with stars which are nearly in its parallel. When the parallax and consequently the distance for any given time is known, the distance and parallax for any other time can be found from theory. By observations of this kind, combining the observations of La Calle at the Cape of Good Hope with other observations made in Europe, the parallax of the horn of $\alpha$ and of $\gamma$ were fixed with great accuracy. Mr. Henderson has recently investigated the values of the moon's parallax from a comparison of his own observations at the Cape with those made at Greenwich and Cambridge. (Mem. Astr. Soc., vol. 3, p. 283.)

It will be seen that the point from which the moon's zenith distances are measured is in the prolongation of a line drawn from the center of the earth, and not in the prolongation of a line in the direction of gravity, which is pointed out by a plumb-line. The correction which is to be applied to the

astronomical zenith, in order to find the geocentric zenith, is given in many collections of tables for a certain hypothesis of the figure of the earth. The horizontal parallax given in the Nautical Almanac is that which belongs to the equator where the earth's radius is largest. A second table for redetermination of this equatorial parallax to the parallax proper to the place of observation (viz. log. rad., supposing the equatorial rad. = 1) always accompanies that above referred to.

Parallax of the Sun—The first attempt to determine the sun's distance seems to be due to Aristarchus of Samos, and presupposes the knowledge of the moon's parallax. On drawing a figure, it will immediately be seen that when the moon has completed her first quarter (she is then said to be dichotomized, or cut exactly in two), the sun and spectator form a triangle, which is right angled at the moon. Now the angle which separates the sun from the moon can be observed at the same instant: suppose it $= \theta$.

Distance earth & sun = distance earth & moon $\propto \sec \theta$.

The exact moment of dichotomy cannot be noted with much accuracy; yet repeated observations would show that the sun was far more distant than the moon. The ancient astronomers seem to have estimated the sun's parallax to be from $2''$ to $3''$, which suffered a gradual reduction as the means of observation improved. The parallax of the sun might with modern instruments be measured in the same way as that of the moon or planets above described, but not so well, as a longer time must elapse between the passage of the sun and the moon; and it appears that early in the 1st century, says that Hipparchus computed the moon's parallax from the phenomena of solar eclipses, that is, he deduced the value of the moon's parallax from the phenomena of solar eclipses on two suppositions of the sun's parallax, namely, that it was 0, and again that it was a definite small quantity. As the circumstances of a solar eclipse vary from the effects of parallax, it is clear that in this way Hipparchus would get something like equations of condition involving the parallaxes of the sun and of the moon, which could be solved by the problem of Apollonius. By this or some other method, he could determine the relation between these two quantities.

We have thus shown that an approximate knowledge of the distances of the moon, sun, and planets, in terms of the radius of the earth, requires nothing more than observation and the solution of a triangle one side of which and the two including angles are known. The magnitudes of these bodies can be immediately calculated from their apparent diameters and true distance; so that up to the present there is room for scepticism, if it were granted that the angles of a triangle equal right angles.

There is a method of ascertaining the parallax by one observer. Let Mars in opposition be the object, and compare it in right ascension with a neighbouring star in the same galactic meridian, and also again after his transit. The parallax, being wholly in a vertical circle, will not affect the right ascension in the meridian; hence the meridian comparison will give the true difference of right ascension between the planet and star. The other observations (after correcting the place of Mars by his hourly motion, which is known either from the tables or from observations on preceding and succeeding days) present right ascensions of the planet affected by parallax in different ways, and from these effects it is easy to determine the value of the horizontal parallax, and consequently the distance of the planet in terms of the earth's radius at the place. The star of comparison and the hour angle must be so selected that no error can arise from uncertain determination of position. Similar observations which involve parallax may be made with the telescope and a micrometer circle, but these observations do not admit of much nicety.

Kepler's discoveries, that the planets move in ellipses round the sun in the focus, that the area swept by each radius vector in a given time is a constant quantity for the same planet, and lastly, that the squares of the planetary periods are as the cubes of the mean distance, have supplied means for a much more accurate determination of the sun's parallax. Assuming these laws, the form of the orbits and the distance of the planets and their mean distances can be determined from observation; hence, if the parallax of every one planet can be found, the parallaxes of the sun and of all the other planets can be computed. Observations of Mars

- Though these discoveries are due to Kepler, the satisfactory proof of their truth was given by Newton.
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for instance, at his opposition, made at the Cape of Good Hope and at Greenwich, will afford a very tolerable value of his parallax and hence of his distance. Again as the proportion between the distances of Mars and the earth from the sun at any time is known from the form of their orbits and their periodic times, and the angle between the sun and Mars at the earth can be observed, the triangle between the sun, earth, and Mars can be completely solved, and hence the distance of the sun and his parallax be computed. These observations can be repeated at every opposition of Mars, and if Mars be compared by the micrometer with stars near the same parallel, there is scarcely a limit to the possible accuracy of the observations. In the *Naut. Alm.,* 1639, pp. 551-55, there is a list of the stars with which Mars is to be daily compared at its opposition in that year. (Mem. Ast. Soc.)

From this however by which the parallax of the sun is determined with the greatest certainty, is that of the passage of Venus over the sun’s disc, commonly called the transit of Venus. [Transit of Venus.]

In the figure let Ss be the sun, Ee the earth, and V and V’ two positions of Venus, which is supposed to be moving in the direction VV’. To make the figure simple, we suppose the earth to be at rest, and that V’ repays the excess of the angular motion of Venus above that of the earth. A spectator at E will see the commencement of the transit when Venus is at V, but a spectator at e will only begin to see it when Venus is at V’. The angle ESS’ is the excess between these two moments is equal to the time in which Venus passes from V to V’, or in which she describes the angle ESP the sun with her relative angular motion. But the angle ESS’ is twice the sun’s horizontal parallax; hence, since the time elapsed between the ingress at the two places is known from observation and from the difference of longitudes, and the hourly angular motions of Venus and the earth round the sun are known from the tables, and consequently the difference of these motions, the horizontal parallax of the sun can be found. It evident that as the ingress is accelerated at E and retarded at e, so the egress will be accelerated at E and retarded at e, Venus then occupying the positions V’ V”.

Let us suppose further that a spectator who saw the ingress at E, and therefore as early as possible, should by the rotation of the earth be carried to e where he would see the egress as late as possible, while the spectator of the late ingress at e is in like manner carried to E, where he sees the earliest egress. In the first case the time of the ingress is increased as much as possible by the effect of parallax, and in the latter case it is equally diminished. Now suppose the parallax of the sun to have a certain value, the parallax of Venus and the effect of these parallaxes in increasing or diminish the duration of the transit are the same as if the positions of the fixed stars can be computed. Hence when the durations are really observed, the differences between the observed duration and that which would have been observed if the spectator had been placed at the centre of the earth, gives the actual amount of the parallax. The special excellence of this method consists in the nicety with which a particular phenomenon can be observed, namely, the first streak of light which is seen after the interior contact at ingress and the last streak before the interior contact at egress. Two points on the earth at

The explanation is only intended to exhibit the principle on which this very important problem depends.

This observation seems not to have been quite as definite as was expected; a little confusion was remarked at the point of interior contact before the entrance of the thread of light, a sort of black drop (gutta aegra) Mr. Halley saw black threads connecting the edges of the sun and moon about 30 minutes after the first contact at ingress. The image in the eclipse of May 18, 1790, (Jenn. Ast. Soc. vol. iv, p. 11, which seems to be a phenomenon of the same kind.

chosen where the beginning and end are much as possible, in which the duration is shortened as much as possible, while it is increased in the other. Every observation of either ingress or egress can in fact be used for determining the parallax, provided the longitude of the place of observation and the time are sufficient to be well known; but where both the ingress and egress are observed, the duration alone requires care. Transits of Venus were observed in 1761 and 1769, and the parallax of the sun deduced by various geographers. (Lagrange, *Mémoires de Berlin,* 1766; Encke, *Der Vollkommene Welt,* 1824.) The next transits will take place in 1874 and 1882.

In the preceding part of this article the methods of determining the parallaxes, and consequently the distances of the bodies composing our system, have been described, and we will now point out the way in which this knowledge is applied. Every observation of the sun, moon, or planets is affected by parallax and must be corrected for this previous to further calculation. All celestial bodies are apparently elevated by the refraction of the atmosphere, and those of our system are depressed by the effect of parallax. In aqual works there are tables for reducing the observed altitude of any heavenly body to its true altitude, i.e. to that which we would have if there were no atmosphere and that we were at the earth's centre. In most of the problems from which the longitude is determined astronomically, in solar eclipses, occultations, and lunar distances the great difficulty and trouble is in computing the effect produced by the moon's parallax. Astronomers have invented convenient formula for this purpose, and by means of the parallax in right ascension and declination is to be calculated; or finally, to the ecliptic, when the parallaxes in longitude and latitude must be found. The rules for these computations are given in treatises on Astronomy.

The mean eccentric horizontal parallax of the sun, according to Encke, = 8" 5776. Its true value for every ten days is given in the *Naut. Alman.* at the end of the ephe merides of the sun and moon. The equatorial horizontal parallax of the moon for mean noon and midnight is at page 13 of each month, and the parallaxes determined are in the last column of the planetary meridian ephemerides.

One effect of parallax is, that the moon appears under a larger angle when near the zenith than when near the horizon. This is contrary to common opinion, and very easily explained physically, but in any one who can handle a sextant with ordinary care. When the moon is in the zenith, the horizontal diameter may be augmented from 30" to 40". There is a table for this augmentation of the moon's semidiameter in most nautical works. Constant of the ephemeris (constante de la parallaxe) is the angle under which the earth's radius would be seen at the centre of the moon when she is at her mean distance. The radius chosen by La Place is that which belongs to a latitude of which the square of the earth's motion in the apparent displacement of the fixed stars, and this could not be supplied.

PARALLAX OF THE FIXED STARS. When Copernicus proposed his hypothesis of the earth's motion, one striking astronomical objection was, that the enormous displacement of the spectator's place which his system supposed was not detected by the proper positions of the fixed stars. Every improvement in instruments, in the art of observing, or in the science of computation, seemed to increase the distance of the sun, and consequently the orbit of the earth, and still no sidereal change would be detected. The earth remains where it is, and brought forward physical arguments, of which however the conclusiveness is not immediately visible, the Copernican hypothesis was embraced on the grounds of its symmetry and simplicity rather than on demonstration. Opponents of the Copernican hypothesis asked for some effect of the earth's motion in the apparent displacement of the fixed stars, and this could not be supplied.

Many attempts were however made. Hooke erected a zenith sector at his chambers in Gresham College; and made some interesting observations, but which he fancied he could trace the effects of parallax. Flamsteed found variations in the north polar distances of fixed stars, which he attributed to parallax, although, as was shown by Cassini and Roemer, this would have produced re-
sults with a totally different law. Roemer himself, after many efforts to deduce parallax from observations in declination, renounced the attempt, on account, as he says, of 'a certain vagueness of the declination, which can neither be attributed to refractions nor parallaxes,' and pursued his investigation by observations in right ascension, in which it seems he believed himself to be successful. At length Bradley commenced the research with far better astronomical means, and his direction of the declination, as well as of the parallax, explained the phenomena which had perplexed his predecessors. It is curious that Roemer, who had discovered the gradual transmission and finite velocity of light, should have been perplexed with the necessary results of this very property in another shape; and that Bradley, while pursuing the problem of parallax, which had been originally interesting as a proof of the earth's change of place, should have hit upon phenomena which satisfactorily proved the earth's motion, and so confirmed the Copernican hypothesis by evidence different from what he sought. Bradley's observations further showed that the effect of parallax in any of the stars observed by him could not amount to 2', and probably was not 1'.

The nature of the changes in the places in the fixed stars, which the change of position in the earth would produce, may be seen from the following figure. Let S be the place of the sun, E that of the earth, and s that of a fixed star. Then the star is seen from the earth in the direction ES, and from the sun in the direction Sr; the difference in these two directions is the angle ESs, that is, the angle of parallax. If Sr, Sr', be drawn parallel to ES, ES', and the observations made from the earth be referred, as observations of this kind are always supposed to be, to the sun, the true place of the star is s', while the place which is assigned to it by observation is s'. At the end of half a year the place of the earth will be effete, and the star is seen in the direction E's. Hence it is referred to the position "s" in respect of S. It is evident that the effect of parallax is to cause the star to appear to describe an orbit round its true place in a plane parallel to the ecliptic, similar and equal to the earth's orbit round the sun, and further, that parallax always in a plane passing through the star, sun, and earth, and that its effect is to diminish the angle which the sun and star subtend at the earth. When this is clearly conceived, it will also be seen that this angle, which is similar to the earth's orbit, will be seen obliquely from the earth, and consequently be projected into another ellipse with altered proportions. The same figure would serve for an explanation of aberration, except that aberration is in a plane defined by the star and the line of the earth's motion, which direction is at right angles to the line just drawn through the earth and sun, so that the phenomena of parallax and aberration are similar, only the effect of parallax is at right angles to the effect of aberration. This affords a convenient mode of computing the coefficient of parallax when that of aberration is known.

There is another view of parallax. Suppose a spectator at the star s; then he would see the earth's radius vector SE under the angle of parallax. The earth's orbit may be considered to be circular, and as the plane is inclined to s, this angle is at right angles to the line just drawn through the earth and sun, and therefore the phenomena of parallax and aberration are similar, only the effect of parallax is at right angles to the effect of aberration. This affords a convenient mode of computing the coefficient of parallax when that of aberration is known.

This similarity between aberration and parallax is not rigorous, but near enough to be strictly true if the earth moved uniformly in a circle. There are convenient tables for computing aberration for a given coefficient of aberration. Calculate the aberration by these tables for 0° and 90°, then take the sine of the angle, divide by the seconds of the constant of aberration, and you have the coefficient of aberration; the parallax is the logarithm of 1 + 2, or the times when the parallax in right ascension or declination is the greatest possible, and these times will be when the effect of aberration in those directions is 0, and zero.

Sir William Herschel first pointed out the mode of detecting parallax which affords a probability of success, viz., that which depends upon the measurement of double stars. In his paper, Phil. Trans., 1762, part i., p. 82, he showed that if the stars which compose a double star are at different distances from the earth, which was at that time supposed to be the chief cause of differences in magnitude, they must be differently affected by parallax, and therefore that their apparent distance, and consequently the greater or smaller effect of parallax, will be altered by a change of position in the spectator. Not the appearance, but the apparent change of position of two neighbouring stars can be measured with great accuracy, the problem of parallax is thus reduced to that of finding a double star in which a variation of distance is observable during the life of the observer; the greater the change of place requires. It was in this important that Sir W. Herschel discovered that very many double stars have a relative motion both in distance and angular position, which proves them to be connected systems, and that unexpected result, which has been confirmed with the accuracy and genius, seems to have led him from the investigation of the subject into his profound and original researches. Sir John Herschel (Phil. Trans., 1826, part iii., p. 266) extended his father's proposal for the discovery of parallax by showing
that the variation produced by parallax in the angle of position of two stars is a more sensible phenomenon and one memoir on the subject first appeared in the **Phil. Trans.**, 1827, p. 126, he published a considerable list of stars suitable for this research, with the times of year when the observations would show the greatest effect of parallax.

It has been shown that the earth’s change of place in its orbit causes each star to have an apparent motion in an ellipse of which the major axis is parallel to the celestial and equal to the diameter of the earth’s orbit as seen at the distance of the star, and the minor axis equal to the distance of the star from the sun. As the two stars are a connected system, and comparatively near each other, the stars will appear to describe two equal and similar ellipses, and the line joining their apparent places will be equal and parallel to the line joining their positions. The actual effect of parallax in micrometric or relative measures of distance and position in a connected system. But if one of the stars be much farther from us than the other, suppose it ten times farther off, then the apparent ellipse will be 100 times smaller than before. If any stars be a connected system, and comparatively near each other, the stars will appear to describe two equal and similar ellipses, and the line joining their apparent places will be equal and parallel to the line joining their positions. The actual effect of parallax in micrometric or relative measures of distance and position in a connected system.

Sir William Herschel we measure the apparent distances of the two stars, those are best suited to the purpose in which the line joining the stars is in the direction of the major axis of the parallactic ellipse, i.e., parallel to the ellipses. If the two stars are equally distant from us, and a star near the pole of the ellipse will be very well suited to either kind of measure, as the apparent ellipse is then almost a circle. Since the application of clock-work to large equatorials, we think that the measures of distance of double stars may be nearly as accurate as those of position. It is, however, further, that any telescopes which have yet been constructed may be mounted equatorially and carried by clockwork. Most of the close double stars are probably connected, and are therefore unfit for the detection of parallax. Again, when the distance exceeds a few seconds, it is impossible to attack the problem by any other means. If the wire micrometer and with high powers are not satisfactory, for the eye in delicate measurement must see both stars at the same glance. The number of stars apparently double in which parallax is likely to be found, and so close to the right ascension and declination, and of which the diameter of the circle in which the stars are seen in the micrometer, is probably very small: happily there is another instrument of equal accuracy with the wire micrometer, and of wider grasp, which can be applied to this research, the **Heliometer**. [Micrometer.] The heliometer will measure distances of positions as easily as the wire micrometer can measure seconds.

In the last-named property, that of measuring considerable angles, the heliometer is unrivalled, and thus we see its especial use in the researches connected with parallax. It is of great value in measuring similar angles, and the divided eye-piece, which is found very useful for small measures of distance, is, like the wire micrometer, limited to this object.

For his researches on parallax, Bessel selected the double star 61 Cygni as a double star having a large proper motion. This property leads us naturally to guess that it is a comparatively near star, as its actual velocity would otherwise be enormously large. Two stars a and b are chosen, a in the direction joining the components, and b a distance of 61 Cygni in the angles to the direction of the parallactic ellipse.

The observations of b are made by bringing it into the middle of the two stars, those of a by placing it in the same line with the two stars. As the two stars of 61 Cygni are nearly of the same brightness, the observation is exceedingly accurate. These measures were continued for fourteen months with very little interruption. The stars a and b are so far removed from 61 Cygni as to render any connexion highly improbable. Variations were found in these distances, which, being compared with the effect of parallax, would produce, are exactly accounted for; therefore this variation is produced by parallax, for it can be shown that any other known cause of disturbance has not been got rid of by the skill of the observer. The result is that the parallax of 61 Cygni is 0".314; whence the distance of 61 Cygni is 658,000 times the distance of the earth from the sun, and from the star is 104 years in reaching us. Though subsequent observations may modify this result, there is no probability that it will undergo any considerable alteration. (From Astronom. Nachr., 1875, p. 8.)

For Struve’s inquiry into the subject of parallax, see his splendid work *Stellarmum Duplilicium et Multiplicium Mesurae Micrometricae*, etc., annis 1824 ad 1837 insituita, p. 89, where he enters very fully into this subject.

PARALLAX, ANNUAL, is the angle under which the earth’s orbit is seen by a superior planet.

PARALLAX, in practical optics, is the longitudinal displacement of the wires in a telescope or microscope. If the wires are a known distance apart, and the glass, the image of the object is not seen distinctly when the wires are so seen. On giving a little motion to the eye, the object will seem to move upon the wires. If it moves in the direction of the eye, the cell carrying the eyepiece must be moved on the instrument. There are means for this adjustment in all instruments which require it, and it is a point to which the attention of observers should be very carefully directed.

PARALLEL ROADS OF GLEN ROY. Glen Roy is one of several other outcrops of the Highlands of Scotland exhibit very distinctly a series of parallel and nearly horizontal lines, embracing the sides of the hills and entering many of the lateral galls, at levels from a few to several hundred feet above the general bed of the valley. The important evidence which is obtained by this method, and which it is proposed to communicate to you, is a solution of questions regarding the origin of valleys, the disposition of alluvial and diluvial detritus, and the subsidence or elevation of large tracts of land, and gives us to present a critical examination of the state of the geologist's investigation on the subject. We have been and examined Glen Roy; but the principal information in the following notes is gained from Dr. MacCulloch, Sir T. Lauder Dick, and Mr. C. Darwin.

Glen Roy is one of the districts of the Lochain, whose headwaters gather on a wild mountain tract near the source of the Spey. The water of Roy runs nearly south, and joins the Spean, which turns westward to enter the great valley of Scotland, below the south-western extremity of Loch Lomond. Passing from Fort William to the foot of the mountains, we have porphyry, gneiss, mica schist, primary limestone, and quartz rock, much disguised by diluvial accumulations. Glen Roy divides, not indeed exactly, the mica schist and gneiss systems, the former predominating on the east, and the latter on the west side of the mountains. The source of the Spey is a limited tract of granite; and the low summit of drainage between Glen Roy and Glen Spey is formed of this rock. From this flat and boggy summit the descent is gradual to Loch Spey on the east, Glen Erse ascending from the valley and giving rise to the river, as MacCulloch terms the part near the head, is an oval valley, about four miles in length and one or more in breadth, and bounded on two opposite sides by high mountains, yielding two streams from the north-west and south-east, which meet near the middle of the valley. From their junction the united water of Roy flows in a gradual manner to the south-west for about two miles, where the valley contracts to a low rocky pass, in which the river runs a troubled course, and then enters into the wide and deep valley of Lower Glen Roy. At the extremity of the rocky gorge which separates the upper from the lower glen, MacCulloch directs attention to a remarkably flat rock; and observes that above this gorge, in Upper Glen Roy, no district is more terraced or level, but a narrow strip of land, tending from near the junction of the streams which form the Roy towards Loch Spey; and it was proved by the spirit-level that this line was level with the remarkable flat rock at the gorge which terminates Upper Glen Roy, and also with the uppermost of three such lines, terres, or straths, in Lower Glen Roy. (Both Sir T. Lauder Dick and Mr. Darwin represent this upper line as being traceable all round Upper Glen Roy to near the edge of Loch Spey.) Passing from Upper to Lower Glen Roy, the single line of Upper Glen Roy ascends from the valley and gives rise to the river through the hills, right and left, with seemingly higher and higher sweeps, and is followed by two other perfectly parallel and
equally continuous lower lines, till Glen Roy expands into Glen Spey. Here the two upper lines end; but the lower one appears on the north and south sides of Glen Spey as the lower river, and so on, as the river descends the pass of Muckul, and turns southward a little way up the Glen of Loch, and still farther along the sides and round the head of Loch Trig. In a westward direction this line continues down Glen Spey on both sides, about half the distance from this line to the Loch Eil, with the rotation it has been noticed in the Great Valley between Fort William and Inverness. Another line however, a few feet higher than the highest in Glen Roy, appears in the upper parts of Glen Gluy, which, running parallel to Glen Roy, enters Loch Loechy; Mr. Darwin notices a line in another smaller tributary to Loch Loechy, near Kilfinnun; and describes a short terrace which appears on the south side of Loch Spey, about sixty feet above that lake, and higher than the highest terrace of Glen Roy. Sir D. Brewster has also observed terraces resembling those of Glen Roy in a part of the valley of the Spey, several miles below its source.

The elevation of these lines above the sea is known approximately, but not with the exactness demanded by a phenomenon so curious in itself and so fertile of subjects for geological speculations. In the following table we have combined the statements of Macculloch, Sir T. Lauder Dick, and Mr. Darwin. The last writer thinks Dr. Macculloch's measures of the terraces in Glen Roy 100 feet in excess. Relative levels of the various lines in Scotland:

<table>
<thead>
<tr>
<th>Location</th>
<th>1st Level</th>
<th>2nd Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>South of Loch Spey</td>
<td>1202</td>
<td>1302+</td>
</tr>
<tr>
<td>Kilfinnun</td>
<td>1202</td>
<td>1302+</td>
</tr>
<tr>
<td>Glen Gluy</td>
<td>292</td>
<td>1274</td>
</tr>
<tr>
<td>Upper Terrace, Glen Roy</td>
<td>292</td>
<td>1274</td>
</tr>
<tr>
<td>Middle Terrace, Glen Roy</td>
<td>200</td>
<td>1182</td>
</tr>
<tr>
<td>Lower Terrace, Glen Roy</td>
<td>92</td>
<td>722</td>
</tr>
<tr>
<td>Loch Loechy</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>The sea at Loch Eil</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

The lines, shelves, or terraces (for each of these names is locally appropriate) may not be confounded with the more ordinary occurrences of slight successive terraces of gravel, or with the longer declining gravel banks which margin the sides of many valleys where they pass from the mountains to plain countries or the sea; they should be distinguished also from the similar little terraces which often appear at the summits of drainage in mountain countries. Such gravel terraces are seen both at the summit and at the foot of Glen Roy, and in each case appear intelligible as the result of fluvial action at higher levels than the present water-channels.

The lines of Glen Roy and the other valleys are not short protruding terraces connected with the several lateral affluents, nor declining planes of gravel, but almost perfectly continuous shelves, sloping toward the valley from a level line, and almost perfectly para llel through all the various windings of their linear extent, and round the hollows and projections of the hills, whether these are small or great, sudden or otherwise; and each respective range, on one side of the glens, is exactly on the same level with that corresponding to it on the other side. This almost perfect horizontal uniformity and continuity of range is the grand feature of the phenomenon, and though easily admitted on ocular inspection, it is satisfactory to know that Sir T. L. Dick has proved it by careful levelling with Mr. Maclean on each of the 'shelves' in Glen Roy. With such characters it is not wonderful that these mysterious works of nature should be supposed the effect of art, and the term of 'Parallel Roads' is far from inapt, and is certainly very descriptive.

The shelves generally appear much higher and even more distinctly defined when viewed from below or from a distance; but when inspected more narrowly, they appear very indistinct, and one may actually be treading on a shelf without being aware of it. This arises in a great measure from the fact that the surface of the shelves is far from level, but being often a little concave above and a little convex below, easily upon a near view basis itself in the general slope of the mountain.

Sir T. Lauder Dick represents the general figure of a section of the shelf thus: —

Dr. Macculloch gives many representations on a small scale, which show the really sloping character of the shelf or terrace, the angle of declination from the horizon varying from 12° to 30°, while the breadth of the terrace part varies from 10 to 70 feet; where the slopes of the 'lines' are steepest their surface is narrowed, and generally where the ground slopes the least the terraces are the broadest. A real profile of one part is given below by the black line.

According to Mr. Darwin's view of the relation between the actual form and the original outline of the fundamental rock, one part will appear to be formed by excava tion of the rock, and another part by accumulation of detritus, very slightly projecting beyond the slope of the mountain. Macculloch's drawings indeed represent the shelves as hardly in any case projecting into a mound. Another part is drawn to represent a valley terrace composed of gravel, to which the shelves (where they cross valleys) occasionally unite on a level, and thus form broad expansions. The shelves entirely disappear when crossing any part of the mountains in which the bare rock is exposed; for loose matter cannot accumulate there, and the rocks themselves, from their laminated structure, do not readily become worn into any regular form. They likewise disappear when crossing any part which is greatly inclined; for their own slope then coincides with that of the alluvial covering, and cannot be distinguished from it. (Darwin.)

The actual surface of the shelves is very irregular: they are composed of the same kind of alluvium with that covering the whole surface of the mountain. (Darwin.) They commonly contain rounded pebbles, and are in many places covered with large masses of stone, some of them many tons in weight, lying for the most part quite detached on the surface, and having their scuter angles rounded off in the greatest number of instances; in short, in every respect resembling those fragments generally found strewn on the margin and on the shallow edge of alpine lakes. In some places, where the stones are large and the shelf narrow, a single block covers its whole breadth. When rock appears anywhere on a shelf, its angles are also rounded. Sir T. L. Dick, from whom the above description is taken, states that the soil above the highest line of shelf is materially different from that below, which has more gravel, pebbles, and alluvial clay; but Mr. Darwin's subsequent observations do not support this. The cases are few in which the solid rocks are much worn away in this manner; indeed they are not visible on the shelves. Some of the blocks of stone on the shelves have fallen from the heights above; others belong to former removed sites, and are in fact erratic boulders. Among these latter are large granite blocks.

It must be evident, from the foregoing description, that the parallel roads of Glen Roy, and the lines resembling them or connected with them in the neighbouring regions, are marks of the ancient level of water filling the valleys to their summits or nearly so, and extending towards their mouths till within a few miles of the sea, or the great interior...
valley of Scotland. As many lines as we see, so many successive effects are there of water oscillating about particular levels through all the extent of the lines. This is freely admitted by all writers and all observers on the subject. Sir T. L. Dick, who gives abundance of illustrations of similar shelves being actually formed on the steep sides of modern lakes, adopts the hypothesis which most easily and obviously suggests itself, and ascribes the lines in all the valleys to the operations of a lake whose waters were successively lowered. Dr. MacCulloch discusses very ably two other modes of watery action whereby the lines may be supposed to have been formed: first, by a sort of local deluge filling the valley; secondly, by the excavating power of water in a valley previously filled by alluvial sediments to a particular height; and shows each hypothesis to be unsuitable and untenable.

On the view of the lacustrine origin of the parallel roads, it is to be conceived that a lake had existed at the uppermost level of Glen Roy for so long a period as to have accumulated on its margin that alluvium which now forms the uppermost of the lines in question, and that by a subsequent sinking through two successive and similar periods, the two lower ones had been formed in the same manner. (MacCulloch.)
Connecting the whole subject in one view, Sir T. Lauder Dick supposes that Glen Gloucy was antecedently filled with a lake discharging itself by a short stream into Glen Roy, which, at the time of the formation of its upper shelf, was filled by a lake level with the summit of the drainage of the Spey, into which its superfluous water ran, and extending thence to the sides of Glen Spean (then filled with water), but separated from that gleen by a barrier afterwards to be considered. Partially filled with water, the level of water in Glen Roy sunk 80 feet, and still the lake in Glen Roy was distinct from that in Glen Spean. Finally, by a further removal of the barrier, the level of Loch Eynort, as we may term it, was lowered and made motionless to that of Loch Spean. As Glen Gloucy and Glen Roy are supposed to have discharged their waters in the direction where now are the heads of the lakes, so Loch Spean is supposed to have done this by the pass of Muckul, eastward to the Spey, and not westward to Lochy. By the subsidence of Loch Spean, its former head of Loch Gloucy, its waters no longer flowed to Glen Spey, but to Glen Spean; by a similar subsidence at the former head of Loch Gloucy, its waters were turned to Loch Lochy; and by a similar effect at the former head of Loch Spean, its waters turned from the Spey to the westward.

We may further imagine, at what is now the lower end of Glen Roy, either a great subsidence of the land, or a wearing away of a narrow and weak barrier left between it and Loch Spean; the latter is the hypothesis of Sir T. Lauder Dick.

If now it be supposed that, parallel to the then upper (western) ends of Glen Spean and Glen Gloucy, a general subsidence happened, the entire change of the current of water, its action, its state, from an eastward to a westward direction, and the entire drainage of these supposed lochs, follows of course.

Sir T. Lauder Dick ascribes this effect to a grand system of displacement of the crust of the globe, whereby the Great Glen has been produced; that Glen is a symmetrical axis of displacement, of which we can hardly know the true geological date, but it is clear that so remarkable a feature in the geology and geography of Scotland as this Great Glen cannot be neglected in speculation; and Sir T. L. Dick's hypothesis assures no little plausibility from the use he has made of this great line of subterranean movement. Dr. MacColloch, instead of these original separate lakes, of which he cannot see the probable barriers, supposes one continuous lake in the valleys of the Spey, the Spean, the Gloucy, and the Lochy, and imagines barriers on the way to the sea, in the valleys of the Spey and the Lochy, and on the line of the Great Glen.

But with the difficulties under which both these hypotheses labour, in regard to the ancient existence and removal of barriers in such improbable situations, Mr. C. Darwin has proposed a new view of the case, in conformity with the opinion of Mr. Lyell (Princip. of Geology, book iv., chap. 10), regarding the parallel walls of the Great Glen. Captain Hall. Mr. Lyell's speculation on the phenomena of Coquimbo is, that 'the three parallel roads were formed by the waves of the Pacific, and not by the waters of a lake'; in other words, they bear testimony to the successive rise of the land, not to the repeated fall of the lakes of the water.'

From a series of appearances below the lowest shelf of Glen Roy, continued into Glen Spean,—such as the nature and distribution of detritus, the form and position of many short cliffs of Loch Ness, Loch Dochart, &c., Mr. Darwin endeavours to extend this movement to a large portion of the Highland valleys, where no horizontal shelves make it a matter of certainty. Having rejected the hypotheses of separate and connected fresh-water lakes, on account of the difficulties attending them, which even in a single case are great (but if extended to many of the Highland valleys, insurmoultible), Mr. Darwin adopts the alternative, that it was the sea, in the form of narrow arms or lochs, such as those now deeply penetrating the western coast, which once entered and gradually retired from these several valleys.

But that there has been a change of level between the land and sea in Scotland, to the extent of several hundred feet, is proved by Mr. Smith's and Mr. Prestwich's observations at Banff and near Glasgow and other places; and, thus verified, Mr. Darwin traces in hypothesis the effect of an elevation entirely from the intermitting effects, showing that by this means the most peculiar phenomena of the Lochaber valleys would certainly be occasioned.

Objections to this speculation easily arise. —Why, for example, are shelves, the marks of intermission in the elevating forces, so peculiarly prominent in areas of extraordinary equality, confined to a few valleys? Why, after granting that complete sets the upper ends of the valleys, do they cease toward the outlets? Why has Glen Roy three shelves, and the neighbouring Glen Gloucy but one, and that at a much higher level? Mr. Darwin will not, it is true, see for so long a time laved the mountain sides, a few marine shells found except at comparatively small elevations;

Mr. Darwin answers to these objections: 1, that the conservation and even the original formation of basins (for he shows the shelves certainly are) might rather be the exception than the rule, requiring particular slopes, loose materials, and freedom from erosive currents; 2, that the difference of level between the Glen Gloucy shelf and the highest in Glen Roy may be explained as an effect of unequal and oscillating marine waters; that instead of marine shells from the upper parts of marine deposits occur in Sweden, Scotland, and elsewhere.

Such are the speculations to which the parallel roads of Glen Roy have given rise. The progress of modern geology has reversed their course. They may be only supposed to have been icebergs from even distant points, and to have quently rested on the beaches, and it is certainly difficult to account otherwise for the phenomenon. Enough has been said to show how small a compass the question as to the origin of the parallel roads of the Great Glen.

In order to complete the solution of the problem, it is desirable to repeat very carefully the elevating operations which have been attempted by Sir T. Lauder Dick and Dr. MacCulloch.

It appears almost certain that the 'line' in Glen Gloucy is exactly level with the summit of drainage between it and Glen Roy; the shelf of Kickinain and the upper shelf in Glen Roy in like manner are exactly level with the water of the sea and islands of the Western Fringe. The connection of these facts with Sir T. Lauder Dick's speculation of subsiding lakes in the valleys appears more evident than with Mr. Darwin's speculation of rising land.

Very exact leveling operations have proved that the real level of equilibrium of the sea is the Self-tide line (See British Association Report for 1857-8), but beeches are commonly found at the high-water level, which varies so much from the form and direction of channel and other courses, that perfect horizontality in the whole extent of the higher shelf of a river is usual. Such are the deviations of many of the rivers known to take place in some neighbouring arms of the sea which admit the tide unequally. Finally, we ought to know the true form of the imaginary surface to which the objects are obviously. They may lie nearly and yet not accurately in horizontal planes; the horizon were found on comparing distant points, this might be symmetrical to a synclinal or anticlinal axis, and however small such regular deviation, it would have the same kind of interest as the discovery of a true axis of movement in Scandinavia or Dorsetshire. The observations on this subject may be difficult in Lochaber,
...patience has overcome all obstacles of mere levelling in the beautiful operations executed by Mr. Bunt, on a line chosen by Mr. Whewell, between Bristol and Axmouth; and the results which, some years or centuries hence, may accrue to science from that splendid work, might perhaps be even now anticipated by the future work of the ordnance surveyors in the valleys connected with Glen Roy, (Macculloch, in Geol. Trans., vol. iv.; Sir T. Lauder Dick, in Trans. Roy. Soc. of Edin., vol. ii.; Darwin, in Phil. Trans. for 1839.)

PARALLELGRAM (παραλλαγή-γραμμα, parallel-drawn figure) is the mathematical term for a four-sided figure of which the opposite sides are parallel. Such a figure may be obtained from any four-sided figure by bisecting the four sides and joining the adjacent bisecting points. When all the angles of a parallelogram are equal, they are therefore right angles, and the figure is called a RECTANGLE. When the sides are also equal, the figure is a SQUARE: matters of more historical interest are connected with either of these terms than with the generic term parallelogram. Referring therefore to those articles, we shall here give the principal proportion of parallelograms in general.

1. The opposite sides are equal, as A C and B D.
2. The opposite angles are equal, as A C D and A B D, and adjacent angles (as those at A and B) are together equal to two right angles.
3. The diagonals (A D and B C) bisect another.
4. The sum of the squares on the four sides is equal to the sum of the squares on the diagonals.
5. The area of a parallelogram depends only on the side (as C D) and the perpendicular distance (P Q) between that side and the opposite side; so that parallelograms on equal bases and between the same parallels are equal.
6. If the point (5) be taken on a diagonal (C B) and made the vertex of a pair of parallelograms (A 153 and D 158) lying in the equal triangular halves of the parallelogram, these parallelograms will be equal to one another in area.

PARALLELOPPIPED (παραλλαλ-έπιπεδον, parallel-plane solid), more correctly written parallelepiped, is the name given to a solid contained by six parallelograms, which are equal and parallel, two and two. It is in fact a quadrangular prism.

When all the parallelograms are rectangles, we have one of the figures to which our eyes are most accustomed, as in the case of a die, a box, a plank, a room, &c. &c. Persons not acquainted with mathematics would hardly believe that English mathematicians seldom express this most simple and elementary of all solids in less than ten syllables, as follows:

rect-an-gul-ar par-all-el-o-pip-ed.

A more simple term might easily be obtained, and one perfectly consistent with analogy, namely, right solid. Thus a right line might be conceived as generated by the most simple motion of a point; a right surface (or rectangle) by the most simple motion of a right line; and a right solid (or rectangular parallelepiped) by the most simple motion of a right surface. We shall consider the properties of a right solid in the article RECTANGLE.

When the adjacent rectangles of a right solid are squares, the solid is a Cube, for which fortunately there is a shorter term than equilateral rectangular parallelepiped.

The number of cubic units in a parallelepiped is found by multiplying the number of square units in either base by the number of linear units in the perpendicular distance between that base and the opposite one. The diagonals A G, B H, C E, D F, meet in the same point, which divides them all, and the sum of their squares is equal to the sum of the squares of all the twelve sides of the solid.

PARALLELS (παραλλαγή, by the side of each other), the name given by the Greek geometers to lines in the same plane having the relation of being parallel to each other, is one of the most obvious properties that such lines never meet, however far they may be produced or lengthened.

If we examine the properties of lines experimentally, it will be easy to satisfy ourselves of the existence of such pairs as A B, C D, which neither diverge nor converge, and to which common perpendiculars, such as M N and P Q, all of the same length, can be drawn that can meet. We observe that if we draw a line S R T perpendicular to those letters, and take over the angles R S B and R T D, made by the same line with both, will be found to be the same. If then we take the notion of permanence of direction, which always accompanies that of straightness (Dírakron), and also the notion of differing directions, we may make an angle, we may readily see that the relation of situation, which adopting Euclid's term, may be called parallellism, is really that which would be also conveyed by the words sameness of direction; so that if two lines A and B be parallel, B may be substituted for B or B for A, in any proposition which involves relations of direction only, without affecting the truth of that proposition, if true, or its falsehood, if false.

Geometry, as every beginner knows, depends upon a small number of self-evident truths, or rather of propositions the truth of which (with one exception) is so soon and so easily perceived, that no one doubts of them when stated with ordinary attention to clearness of expression. The exception alluded to appears for the first time in Euclid, and has been the occasion of a controversy which has lasted from his time to the present.

It will be remarked that the definition of parallel lines is purely negative; it describes what they are not, not what they are: if lines are parallel, they are not intersectors; if intersectors, they are non-intersectors. Those who would have geometry upon definitions entirely, may think that the difficulty of the theory of parallels arises from insufficient definition: but those who believe it to be deducible from real and positive conceptions, having nothing arbitrary about them, must suspect that, in this purely negative definition of parallels, we have not sufficiently described that very obvious relation of position which distinguishes parallelism from convergence, however short the lines we image to ourselves; to them, perhaps we think of what will take place if they are produced. Euclid, proceeding upon axioms, the admission of which is not considered to be a question connected with the present difficulty, establishes the following proposition: If the two lines S B and T D are parallel, and ST equal to two right angles, then B S and T D are parallel, and ST and TD together equal to two right angles (all which amount to the same thing), then B S and T D are non-intersectors. But before any further step can be made, it must either be proved or assumed that in every other case they are intersectors, and, Euclid, being unable to prove it, assumes it directly. That is to say, he requires it to be granted that if B S and T D are to be less than two right angles, B S and T D will meet, if produced, and on that side on which ST the angles less than two right angles, the last clause is not a necessary part of the axiom, since it can be shown, independently of the present theory, that two lines which must meet make angles together less than two right angles with their intersecting line.

Euclid obviously puts the whole difficulty into an assumption, which, though the most direct course, is not that which is best calculated to give the highest degree of evidence to geometrical truths. For it is a more obvious proposition that two lines which intersect must be parallel, than the given proposition; and this being granted, Euclid's axiom readily follows. If it should be objected that this is merely Euclid's axiom in another form, it is replied that the form is a more easy one, and therefore preferable; just as it would be wiser to assume 'Every A is B, and every B is A,' than the identical bus more complicated proposition 'Every A is B, and everything which is not A is not B.'
It is known then that the difficulty is entirely removed if we grant that 'two lines which intersect are not both parallel to any third line,' or, which is the same thing, that 'through a given point not more than one line can be drawn parallel to a given line.' The theory of Euclid being thereby improved as far as it is capable of being done by a mere difference of statement, it remains to ask, 1. Whether assumption can be dispensed with altogether, and a direct proof of Euclid's axiom, or something equivalent to it, given? 2. If the preceding be answered in the negative, can any more simple assumption be made the foundation of the theory?

The attempt to answer one or the other question in the affirmative, has hitherto been unsuccessful, and has (without any exception but one in which new axioms of another sort are introduced) tacitly contained the defect which their authors were desirous of avoiding. The author of 'Geometry without Axioms' has collected and commented on thirty instances, in each of which he here makes a brief abstract, adding one or two more.

1. The axiom of Euclid in question. 2. Ptolemy; his proof assumes the symmetry of parallel lines on one side, and the other of any line which cuts both. 3. Proclus assumes that the two lines diverge from the line of intersection, and that parallels do not. 4. Clavius assumes that a line which is everywhere equidistant from a straight line, is itself straight. 5 and 6. Two demonstrations of Dr. Thomas Oliver (1604) assume Clavius's axiom, and the same. 7. Simpson (one of his 'Elements'), and Bonnycastle, define parallel lines as those which always preserve the same distance, which is Clavius's axiom in the disguise of a definition. 8. d'Alembert would define parallels as lines, one of which has two points in common with the other, while the other of them, he could not complete the proof of the axiom of Clavis. 9. T. Simpson ('Elements,' 2nd edition) proposed to assume that two lines, one of which has two points unequally distant from the other, must meet. 10, Robert Simpson proposes that the straight line should first approximate to, and then recede from another, without cutting it. 11. Varignon, Besou, &c. would define parallels as lines which make the same angle with a third line: if a third line make the same angle with a given line, it is parallel. 12. Ludlam, Playfair, &c. recommend the axiom which we have also recommended, namely, that two intersecting straight lines cannot be parallel to a third. 13. Leslie proposes that the same axiom of simplicity will be the result of experimenting in this same manner, by making a line revolve about a point. 14. Playfair (in his Notes) proposes to assume that a straight line which turns completely round, and thus regains its first position, must turn through four right angles, whether it continues the same or changes the true point of its revolution. 15 and 16. Franceschini (1787) proposes to assume that the projections of a straight line on a plane making an acute angle with it, increase without limit with the projected line. 17. Some have proposed to define parallels by a straight line which shall be everywhere equidistant from a given line, but that assumption seems to be obviously contained in the conception of direction, that two similar directions make the same angle with any other direction. 18. Mr. Exley (1818) proposes to assume that if four equal straight lines, each at right angles to the preceding, do not meet and enclose a space, a fifth such line would do so. 19. Dr. Creswell proposes to assume that through any point within an angle less than two right angles, a straight line may be supposed to be drawn cutting the sides of the angle. 20. Professor Thompson makes it an axiom that 'if a triangle be moved along a plane, so that its base may always be on the same straight line, its vertex describes a straight line equal to that described by either extremity of the base. 21. M. Legendre (in the earlier editions of his 'Elements') makes a direct appeal to the senses. 22. In the seventh edition he assumes (as in instance 15) that a magnitude increases without limit, where perpetual increase is all that is demonstrable. 23. In the twelfth edition he fairly brings the disputed proposition to rest upon the axiom, that if two angles of a triangle diminish without limit, the third (whenever the base may be) approaches without limit to two right angles, a proposition not admissible when, as in M. Legendre's final construction, the base at the same time increases without limit. 24. In a note to the same edition, he demands as an axiom that no straight line can be entirely included between two straight lines which make an angle less than two right angles, which may easily be shown to be nothing more or less than Euclid's axiom. 25. He attempts to prove it as a consequence. 26. M. Legendre will confine the assumption of Euclid to the case in which one of the internal angles is a right angle and the other less. 27. M. Bertrand extends the use of the term equality; we shall afterwards see. 28. M. Ivory shows that the geometry of the second pair of straight lines will not always meet.

The author of 'Geometry without Axioms,' Colonel Perronet Thompson, whose erudition on this subject would allow en gain of any of his attempts only. Now the whole article was in the press, published a new pamphlet on the subject, in which he proposes to deduce the properties of the equiangular spiral, and to make them the foundation of a proof of Euclid's axiom. Not having been able to give other patriotic evidence of his knowledge, he attempts an assumption as removing the geometrical difficulty, since, by the introduction of a totally new line, it leaves the conventional boundaries of geometry [GEOMETRICAL]: to say nothing of the question which may fairly arise, as to whether the axioms of the theory of lines are not as difficult as that of Euclid.

Two proofs have been referred to as requiring further explanation: those of MM. Legendre and Bertrand. We take the latter successively.

The first assumes all that knowledge which is derived from algebra and the theory of algebraical operations. We premise that the theory of parallel may be strictly deduced, though not without some trouble, if it can be shown that the three angles of a triangle are equal to two right angles. There is a plane which contains c linear units, and the opposite angle C angular units, the other angles containing A and B units. Then it can be easily shown that any other triangle which has the same base, and other than the angles A and B, must be in all respects equal to the first triangle, since C. A. B being the side and adjacent angles of a really existing triangle, C is given when A, B. and C are given. There must then be some analytical mode of expressing C in terms of A, B, and C, such as

$$C = \phi (A, B, C).$$

From such an equation, if it exist, C can be found in terms of A, B. and C, that is, the length of a straight line can be expressed in terms of its angles. Fifth such an equation, we see, is that no equation can determine a magnitude by means of magnitudes no one of which is of the same kind with a, and the only way of avoiding this supposition is by supposing that c does not enter the equation at all, or that C = A, B, so that the two angles are equal in a triangle, where the two give are, whatever the side may be, travelers the triangle is known to exist. Let there be a right angled triangle ABC, and let C be perpendicular to A B; then the triangles ACD, A BC, ACD, has a right angle in each, consequently their third angles are equal, or ACD
It is not our intention to go fully into the objections which have been made to this proof, or to Legendre's answers; all which may be found in the "Elements," edited by Brewster's translation of Legendre. It has the disadvantage of being founded upon a science which requires more and harder axioms than geometry itself, and of which the particular process employed, namely, inversion of a function, is in many cases full of unexplained difficulties; while it has the advantage of not appealing to any new notions of space. As an illustration of the connexion between algebra and geometry, it must always be valuable: but we suppose no one would think of making it the foundation of geometry. Some objections to the use of the imaginary numbers appear to us to have been raised against them, and to have been adumbrated on all sides how to deduce Euclid's axiom, while his opponents imagined that he considered himself as having proved that axiom.

The proof of M. Bertrand is as follows:—Let it be granted that the sum of the squares of any two finite or infinite, are equal, when one can be placed on the other so that any point whatsoever of one lies upon a point of the other: that is, let it be legitimate to say, of the word equal as thus used, that spaces which are equal to the same space are equal to one another. Granting this, it is easily shown that the sum of the squares of equal angles are equal; that, of two angles, the infinite space contained in the greater is greater than the infinite space contained in the less.

Let there be two lines, O F , O G , making with O A internal angles FOA , GOA , equal to two right angles. Then O F and O G are parallel to A B , C B , and C D , and the angles A O B , B O C , C O D , equal to O A , and the angles H B C , K C D , L D E , equal to O A , and all equal to FOA or GOA.

Let all lines with arrow-heads be produced within or without the direction to which the arrow-head points. Then if O A be placed on B C , the lines O F and O G will in their new positions coincide with A G and B H, or the infinite space FOAG is equal to the infinite space GABH; and similarly if O B be produced, the lines O F and O G will coincide with A G and B H, or the infinite space FOAG is equal to the infinite space GABH. Hence the three angles at B are equal to the three angles at B in any triangle, and therefore ABC is equal to A B C.

The angle C B E being equal to B A C and A B C together, and C B D being equal to B C A, it follows that E B D = B C A; and the three angles at E are equal to the three angles at E in any triangle, and therefore ABC is equal to A B C. Hence the angles at A, B, C, D, and between these the angles at A, B, C, D, and therefore ABC is equal to A B C. Hence the three angles at D are equal to the three angles at D in any triangle, and therefore ABC is equal to A B C; and therefore ABC is equal to A B C, and therefore ABC is equal to A B C, and therefore ABC is equal to A B C.

Next, any triangle A M N which has the angle A, must have the sum of all its angles also equal to two right angles. Continue the preceding process until the triangle A M N is completely enclosed in the triangle A M N, which has all the three angles of the three angles of the triangle A M N, M N E, N E F, make up the angles at A, B, C (two right angles), those at M (two right angles), and those at N (two right angles); six right angles in all. Consequently each set of angles, in each triangle, must be equal to two right angles; these three sets making up six right angles, no one set can fail short of two right angles, without another set exceeding it, which has been shown to be impossible.

Lastly, on the preceding assumption (namely, that there is one such triangle), every triangle has the sum of its angles equal to two right angles. Let P Q R be any triangle
not equangular with $ABC$; one of its angles must be less than one of the angles of $ABC$; for if not, the sum of the angles $P, Q, R$ would be greater than that of $A, B, C$ or greater than $180^\circ$. Let it be noted that $P$ is less than $A$, and that $Q$ is greater than $B$, and that $R$ is greater than $C$.

Let $PQ, QR, RP$ be the sides of a triangle $PQR$ containing $V$, and $PQ, QR, RP$ be the sides of a triangle $PQV$. Then, from the common angle, the sides of both triangles are equal to each other. Hence, if any one triangle is equangular, the other must also be equangular; the same must be true of all triangles whatsoever.

3. If we then deny the preceding truth in the case of any one triangle, we must deny it in the case of all. Let it then be universally denied; and, taking any triangle $ABC$, take a point $D$, at which make the angle $\angle BDE = \angle BCA$. Then the angle $BDE$ must be greater than $\angle BAC$; for if not, $\angle DEA$ and $\angle EAC$ are at least equal to two right angles. Then $\angle ACD$ is not equal to two right angles, the angles of the $\angle ABC$ and the $\angle CDE$, $\angle EAC$, are greater than two right angles. Hence, if $\angle BDA$ and $\angle CDC$ are both of them greater than $\angle BCD$, one of them is greater than $\angle BCD$.

A triangle $\triangle VPK$ containing $V$ with $PQ$, $QR$, $RP$, and $VP$, $VQ$, $VR$, the angles at $V$ common with $PQ$, the angles of $\triangle VPK$ are together equal to two right angles, and because $\angle PKX$ has an angle in common with $\angle PQR$, the angles of the latter are also equal to two right angles. Hence, if any one triangle is equangular, the other must be equangular; the same must be true of all triangles whatsoever.

4. Let us consider the preceding process as containing the most remarkable addition which has been made to the theory. With regard to the whole question, we do not consider the difficulty as one of different kind from that of the quadrature of the circle or the trisection of the angle. In the earlier stages of mathematical inquiry, the difficulty was not evidently impossible was attempted, and failure was, properly and modestly, attributed to the want of capacity in the investigators. In the instance before us, the object was to deduce positive properties from a purely negative definition, involving, be it implied, only an absence of, or more or less, of the part of the truncs and limbs. Lastly, whole regions of the body may be paralysed; and of those cases the chief varieties are, hemiplegia, in which one side—half of the body—is deprived of sensation or motion, or of both; paraplegia, in which the lower extremities are affected, the upper retains both sensation and motion; and general paralysis, in which the loss of nervous power extends over nearly every part of the body.

Other varieties of parole are described from peculiar circumstances in their cause or symptoms; as lead-paints, which is produced by the influence of lead, and the same as caused, as to the hands of painters, or received into the system generally; croupy plan, which commences in a muscle or muscle, and gradually extends over a large portion of it; shaying plan, in which the lower limbs are paralysed, and the patient not entirely paralyzed, any attempt at its exercise is affected by a trembling unsteady action, like that of a fatigue muscle.

The conditions under which these various forms of parole are manifested are not the same in all cases, and the causes of them are not the same in all cases. The circumstances under which a person is liable to suffer from these different forms of parole may be either internal or external. One of these is by the disease of the brain, by a fracture and depression of the skull, or by a large effusion of blood into the subarachnoid space of the brain, by preventing the free circulation of the blood and producing a state of paralysis. Deorganization of the brain by suffering other excessive change of structure has the same effect, but often in a less degree, producing not a complete loss, but an im-
injury of nervous power. Injuries of the same kind affecting the oblique side of the brain produce hemiplegia, the loss of power existing on the side of the body opposite to that on which the brain is compressed, in consequence of the destruction of the nervous which takes place at the medulla oblongata. [Brain.]

For a similar compression of the spinal chord in any part will produce a paralysis of all the parts of the body whose nerves come off below the level of the injured part; and a similar obstruction applied to a single nerve will affect only that part which it supplies. The effect is the same whether by the nature of the disease the performance of the functions of the nerves or their centres; the results of each differing only in the suddenness or slowness, or the degree of intensity with which its symptoms are produced.

There are some other but rarer and generally less serious cases of paralysis, in which no material change is discoverable in the structure of the nervous system. These are called functional or idiopathic paralysis; but it may be reasonably doubted whether they do not all, or for the most part, derive their origin from a foreign poison, from the action of poisons, as those who work with lead or mercury.

General paralysis, in which all sensation and voluntary motion are impaired or lost, is most commonly the result of apoplexy, or of severe injury to the head, producing concussion; in some cases it is the result of the union of two or more of the other causes, so as to exist in all cases of complete coma, or insensibility. More rarely it is produced gradually; the patient losing in succession the power of motion in all his muscles, and at last existing only with an internal life, but disabled from all active commerce with the external world. This state is usually the result of disease of the brain or spinal chord gradually spreading through their substance; and especially of disease of the latter spreading upwards.

The term paralysis is applied only to cases of cause of paralysis is injury or disease of the spinal chord; and this may originate in its own structure, or be produced by injuries or diseases of the vertebral column or other parts surrounding it. Paraplegia, when the result of disease, commonly affects first the lower extremities and the parts below the level of the lesions, because the first part affected in the greater number of diseases is the lower portion of the spinal chord, from which the nerves supplying the lower extremities and pelvic organs are derived. When produced by injuries of the vertebrae, the looser motion of muscles in the portion of the body affected is the reason why the body to a much higher level; its extent being always determined by the height in the vertebral column at which the injury is inflicted. In either case the disease, whether original or consequent upon injury, tends to spread up and down the length of its motion. It is therefore the second prime mover of the circulatory system, and affects successively the chest and arms, terminating in death when the disease has reached the orifice of the phrenic nerves, upon which the movements of the diaphragm depend.

In paralysis of the brain no sensation and voluntary motion are destroyed, it is not rare to find involuntary movements produced by irritating the skin of the insensible parts. These motions are of the class which are referred to the reflex action of the spinal chord [Nervae]; the power of raising the hair in eructation and from the brain is lost, but the power which the chord possesses of exciting motions when impressions are made upon it, remains. The patient thus affected is, as far as his nervous system is concerned, in the same condition as a behemated beast. His face is in repose, the parts below the divided or injured portion of the chord are of the same kind as those observed after decapitation.

In paraplegia the parts deprived of nervous connection with the brain are, except for the number of the nerves and vessels, liable to atrophy when long subjected to pressure; and hence the sloughing of the back, which commonly tends to shorten the patient's life. The sensibility to the pain produced by long-continued pressure being lost, the foot, when it becomes atrophic, can no longer be moved, and the skin being deprived of its natural moisture, it is not infrequently susceptible to atrophy, or, according to the description of some observers, to ulceration. The patient is greatly disabled from walking, and is compelled to use crutches and a chair.

Hemiplegia, in which the paralysis is confined to one side of the body, usually affects (as paraplegia does) the sensitive and the motor nerves simultaneously. This is by far the most frequent form of paralysis, and in which the popularly called paralytic are usually affected. Hemiplegia generally occupies exactly one-half of the body, the middle vertical plane separating the healthy from the paralytic area. It is a sudden condition recognized in any patient by the flatness and smoothness of the affected side of the face, by the angle of the mouth being drawn over towards the opposite side, and by a general very position of the features. The arm hangs powerless by the side; and in walking, the leg on the affected side is raised after having brought it from the ground by depressing the opposite side of the body, the leg swinging forward with its toe pointed towards the ground like a pendulum. Hemiplegia is most frequently the consequence of apoplexy [Apoplexy], remaining after the patient has recovered from the paralytic state. In general paralysis by which the seizure was at first followed. More rarely it appears to arise from other causes, and is not preceded by any fit, but is developed by degrees from slight to perfect loss of nervous power.

In paralysis of the muscles of the eye, the most commonly affected is the elevator of the upper eyelid and the orbicular muscle of the eye. The power of elevation of the upper eyelid for producing the sound of the eye; its power, the eyelid drops, and the eye is constantly more or less closed; when the latter is affected, the eye cannot be shut, and remains permanently wide open. The dropping of the upper eyelid (ptosis) is dependent on a disease or injury of the third part of the nerves, accompanied by a paralysis of some of those muscles of the eyeball which are supplied by the same nerve; so that the position of the eye is altered, or it cannot be freely moved.

In paralysis of the eye, the upper eyelid (ptosis) is the result of disease of the seventh or facial nerve, or of its branch supplying the orbicular muscle; sometimes this latter branch alone is implicated, but more frequently the whole trunk is affected, and there is coincident paralysis of all the muscles of the face. As far as regards their influence on vision, both cases are almost equally injurious; the first by placing a veil constantly over the front of the eye; the second by destroying the power by which particles of dust, &c. are removed from the surface of the eye, and thus leaving it exposed to the destruction and infection to which it is otherwise subject.

In paralysis of the face many different conditions are observed, according to the nerve which has been diseased or injured. The sensibility of the face depends entirely upon the sensitive or larger part of the fifth pair of nerves [Brain], the motion of the muscles of mastication on the motor or small portion of the fifth pair. Now if either of these three nerves or their sources in the brain be separately injure, the paralysis will be limited to a loss of sensation, a loss of the motion of the muscles of the face, or a loss of the motion of those of the jaw, on the side affected. In the two cases of affection of the fifth nerve, both its sensitive and motor portion are injured, and there is both a loss of motion of the muscles of the jaw and a loss of sensibility of the whole of the skin of the chin, and the lower one or more muscles of a limb or organ being from birth or from childhood weak or powerless, its antagonist muscles do not part into an unnatural position, and hold it there firmly.
and permanently fixed. One of the most important achievements of modern surgery is the cure of these afflictions by the division of the contracted muscle or its tendons. Such operations for club-foot and wry-neck are now commonly performed; and Professor Oppenbach of Berlin has within the last few months cured three cases of squatting by a similar proceeding.

Those however are the only cases in which general rules of treatment can be laid down. The varieties of causes from which paralysis may arise afford sufficient evidence that its treatment in different cases may vary greatly; and yet it not indeed be said to be a disease of itself, since it is only a sign of some disorder of the nervous system, which is often seated at a distance from the part whose motion or sensation is lost; and moreover is often of a temporary kind and but a result either of hemorrhage, or inflammation, or slow structural change of the nervous substance; or it may be produced by the pressure of fractured bones, or tumors, etc. In each case therefore the cause of the paralysis must be treated before there can be any expectation of removing its effects; and for this portion of the treatment the principal means are detailed in the article APoplexy.

PARAMARÍTICO. [GUAYANA, DUTCH.] PARAMATTA, a town in the British colony of New South Wales, in the county of Cumberland, at the mouth of the small river Paramatta, and at the head of the harbour of Port Jackson. Its distance from Sydney, the capital of the colony, is 18 miles by water and 15 miles by land. The population of the town in 1836 consisted of—

<table>
<thead>
<tr>
<th></th>
<th>Male.</th>
<th>Female.</th>
<th>Total</th>
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<tbody>
<tr>
<td>Free under 12 years old</td>
<td>564</td>
<td>412</td>
<td>976</td>
</tr>
<tr>
<td>above 12 years old</td>
<td>875</td>
<td>639</td>
<td>1514</td>
</tr>
<tr>
<td>Convicts</td>
<td>287</td>
<td>162</td>
<td>449</td>
</tr>
<tr>
<td>Total</td>
<td>1766</td>
<td>1834</td>
<td>3600</td>
</tr>
</tbody>
</table>

The large proportion of female convicts is occasioned by the establishment within the town of a penitentiary wherein such persons are confined before they are assigned for service, and where they are returned by settlers on the hands of the government. The building is further used for the confinement of convicts guiltily of offenses within the colony.

The coastal street is a mile long; at the end farthest from the harbour is the country residence of the governor of the colony.

The town, when first founded, was called Rose Hill, but the name of the river on which it stands has since been given to it. There is daily communication with Sydney by means of stage-coaches and steam-boats.

The observatory at Paramatta (founded in 1821) was the private observatory of Lieut.-General Sir Thomas Brisbane, and is now a semi-public establishment, during his residence in the colony as governor. At his return to England, the government adopted it as a public establishment, and it is now under the superintendence of an officer appointed by the Admiralty. For an account of this observatory, see Vol. xvi. of the Edinburgh Journal of Science, 1833.

PARAMÊTRER. This term was first used in reference to the conic sections only, in which it was synonymous with latus rectum; that is, the perpendicular drawn to the axis through a focus, terminated both ways by the curve, was the parameter of the curve. It was afterwards used to denote any straight line or even numerical co-efficient, by the value of which one individual curve of a species may be distinguished from the rest. Thus the curve whose equation is $y = ax + bx^2$ has two parameters, $a$ and $b$. This last of these in general use, and has been reserved only for questions in which what is called the variation of parameters is to be employed. Thus when in the planetary motion the theory of a planet is ascendant by the variation of the instantaneous ellipse [Gravitation : Orbit], and of the equation in that ellipse, in contradistinction to the determination of the motion in longitude and latitude separately, the method of variation of parameters was said to have been employed. But the parameters of the orbits in general are called the elements; and the first term is little used, though it occurs frequently enough to require notice in a work of reference.

PARAMICIPA. [Mánnd, vol. iv., p. 360.]

PARAMÍTHRA, or PARAMÝTHY, called by the Turks, paraisht, or paraisht, vol. iii., p. 309.

PAR in the province of Albania in European Turkey, about 14 miles north of Parga [Parga]: in 39° 3' N. lat. and 16° 43' E. long. The town is situated in the mountainous district which skirts the valley of the Vido, probably the oldest part of the city, the inhabitants of which mountains maintain a partial independence, and are half shepherds, half warriors or robbers. The city covers a large space of ground, but contains many good houses; it is situated on the sloping mountain, the summit of which (about 1000 feet above the level of the plain) is precipitous, while the lower part is tilled of delicious water. The fortress is extensive; in the substructure of its walls are many portions of ancient masonry, and in one angle is an ancient gateway, four feet wide, formed of three stones, now walled up, but taking its title from the town to the fortress are many large isolated dwellings, surrounded by gardens and having loopholes adapted for musquetry instead of windows, an indication of the unsettled condition of the country. This fortress is spacious, shelled with planes, and wooded with delicious fountains. Beside the fortress or old castle, there is a small fortress, or guard-house, called Galata, on another insulated rock. To this fortress many soldiers were made by Ali Pasha. Some ancient masonry of the fortress indicates that this summer it is one of the Epitaphe city on whose site Paramythia stands. The population was estimated by Dr. Holland, who visited the town in 1813, at 9000, chiefly Mohammedans. There were for mosques and a Greek church. It was at that period as a Greek bishopric cojoined, taking its title from both places. Subsequent statement reduce the population to 3500; a diminution resulting probably from the ravages and convulsions to which the country has been subject of late years. Paramythia was a leading commercial town of the Ionian islands, being really united with Margarita, Gardikia, and Dragam. But these towns were frequently, when not pressed by external danger, at war with each other; and when this was wanting, the parties in each town were seldom long without some civic quarrel, or acquired possession of the town, party to treachery, after the fall of Suli.

As in other Albanian towns, all the common articles of Albanian or Turkish dress are manufactured here and by Musulmans. The Greeks are for the most part retail business men.

Paramythia occupies the site of an ancient city of considerable extent and importance, though it has not been certainly identified with any name mentioned by ancient writers. Perhaps it was one of the castles of St. Donatus reared by the Franks, and associated with the name of Sapoepius, by whom it is called. Several ancient bronzes have been discovered in excavations, none of which were in the collection of the late R. P. Kircher, Esq.

(Holland's and Hughes's Travels in Albania; Lives of heroes in Northern Greece; Dictionnaire Geograph. de l'Univers.)

PARAMÍTHRAX. [Mánnd, vol. xiv., p. 299.]

PARAMORPHIA, or THEBAI, a vegetable salt, obtained by M. Theoburnon and Pelletier from opium, in 1835. Its generic name was determined by the position, according to the analysis of Pelletier, appeared to be similar to that of morphia: by M. Coubé he has been called thebaea; and by his analysis, as also by that of Croizat, it appears to contain less oxygen than that of thebain. This name is incorrect.

Paramorphia is white; its taste is rather acid and a bit bitter; it is scarcely soluble in water, but is readily soluble in alcohol and ether, and most so when hot. By a special extraction these solutions yield paramorphia, a salt from the mother liquor solution, being flat, white, crystals possessing considerable lustre. This substance has strongly marked alkaline properties, dissolves readily in dilute acids, and is precipitated from them by the salts. The acid solutions do not yield crystals by evaporation.

Paramorphia differs from morphia in not redissolving concentrated nitre, in not becoming blue with the salts of iron, and in yielding no crystallizable salt with the acids. It melts at 265°, and this distinguishes it from morphia.
P A R

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P A R

cin, codeia, and narcotica, which fuse respectively at 194°, 309°, and 338° of Fahrenheit.

The following are the results of the analysis of this substance by the authors named:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Pct.</th>
<th>Value</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon</td>
<td>71%</td>
<td>70.78</td>
<td></td>
</tr>
<tr>
<td>Hydrogen</td>
<td>6'290</td>
<td>6'469</td>
<td>6'85</td>
</tr>
<tr>
<td>Azote</td>
<td>4'408</td>
<td>6'385</td>
<td>6'94</td>
</tr>
<tr>
<td>Oxygen</td>
<td>17'992</td>
<td>15'179</td>
<td>13'01</td>
</tr>
</tbody>
</table>

Agreement. Magendie, parapornia acts strongly on the animal economy, resembling bruxia and strychyn in this respect.

PARAGOUNT. [TITRE.]

PARANA. River. [PLANTA, LA.]

PARAPET (from the Italian parapetto, compounded of the Greek preposition parap, against, & petto, breast), a low or breast-high wall or fence, to serve as a protection on bridges, terraces, platform roofs, &c., whence it is termed in architecture as a breast-wall.

In Italian archi-

tecture, parapets are generally balustrades. In Gothic architec-
ture, the parapet is merely a continuation of the wall carried up above the edge of the roof, and finished by a coping; unless machicolated, in which case it projects and overhangs the parapet. In modern French architecture, it is generally em-

battled, either in the accostal or in the cheminée buildings, and both the battlements and the crenelles or spaces between them have usually moulded copings. In what is called Decorated Gothic, parapets and battlements are frequently enriched with pannels, or a parapet without battlements is embellished. East

 bastard merlon-house is a fine specimen of such decoration in domestic architecture. (Pugin's Goth. Exemplars, vol. i.)

In many cases such pannelling is perforated; or are open-

work parapets of quatrefoil ornaments and other carved pat-

tens, that we see throughout the period of the Laisser's and the

wife's. A widow is entitled to retain parapernalia ornaments which she has received from her husband, pro-

vided she has worn them occasionally. The wife cannot

give or bequeath such parapernoalia during her husband's life; but when she becomes a widow, it is allowed by law as

to deprive her of them; but he can sell them or give them.

The wife's parapernalia are liable to the payment of the husband's debts, unless the articles were given to her by a stranger before marriage or after marriage: in such case the articles are considered as gifts to the separate use of the wife, and are accordingly neither at the disposition of the husband nor liable to the claims of his creditors; but if such gifts are to be considered as the separate estate of the wife, they are not properly parapernalia.

The family parapernalia are a term in preference to any claim of legates; and if specialty creditors of her husband have taken her parapernoalia for payment of their debts after the personal estate is exhausted, she has a right to reëmber herself out of the real estate which has de-

scended to the heir.

The term parapernoalia is derived from the Greek parap-

epharma, a term which the Roman lawyers adopted to express what in their own language could not be expressed by a single word, and which was compounded of the Greek pra, or extra, and the Latin domus, or house. The parapernoalia comprised the things which the wife brought to the husband's house, and which were not part of her dowry. The common practice at Rome was for the woman to make out a list of such things as she used without which list it was signed by the husband, as an acknowledgment of receiving them, or at least of receiving them in his house. This practice, de-

rived from the Roman law, is still in use in some countries of Europe. The husband did not obtain the ownership of the things included in such list, and in case of a separation, they were restored to the wife: if they were not restored, she could recover them by an action framed according to the circumstances of the case. (Dig., 23, tit. 3, 9.) It must be remembered that the Roman doss is a different thing from the English dowry, though some English writers on law have confounded them. (Koper, Law of Husband and Wife, 'Parapernoalia.' [MARRIAGE.]

PARAPHRASE (from the Greek parasphrasis). A para-

phrase partakes of the nature both of a version, if the Greek paraphrased be a foreign language, and of a commentary. Its object is to express the full sense contained in the words which are paraphrased, by the introduction of circumlocutions, explanatory clauses, and expansions of the author's meaning. A paraphrase, if well and honestly exe-

cuted, is an excellent mode of giving a connected interpreta-

tion of a whole work. The faults to which this sort of commentary is most liable are an alteration of the author's sense, and a degree of weakness and tediousness resulting from the use of unnecessary words. The latter fault is very

Paratissian. The garrison of Dordrige's excellent work 'The Family Expositor.'

PARAPLEGIA. [PARALYSIS.]

PARASANG (παρασάγγ, a Persian measure of length, which, according to Herodotus (ii. 6; x. 53; vi. 42), was equal to 380 English feet; and if equal to one English mile, the parasang was consequently equal to nearly four English miles. Hesychius and Sui-

das also give the length of the parasang at 30 stadia; but the explanation with which these authors connect the parasang, as he says (Arab., ii. 2, 6) that 16,050 stadia are equal to 553 parasangs (16,050 × 30 = 553), the 553 parasangs (16,050 × 30 = 553) is.

Plynt (Hist. Nat., vi. 30) however informs us that the length of the parasang was reckoned differently by different authors; and Strabo states that 16,050 stadia is equal to 553 parasangs (16,050 × 30 = 553).

Franklin (Tour to Persia, p. 17) reckons it at 4 miles; Ousley (Travels, vol. i., p. 23) at between 4 and 3½ miles; and Kinnear (Geogr. of Persia, p. 57) at 3½ miles.

Parasang is a Persian word, and is derived from the an-

tient farsang, which is pronounced in modern Persian, farseng. It has been changed in Arabic into farsak. Various etymologies of this word have been proposed. The latter part of the word is supposed to be the Persian seng, a stone, and the word might thus be derived from the stones which mark the boundaries of the Persian provinces. Bohlen (quoted by Rödiger) supposes the first part of the word to be thepreposition sara, and compares the word with the Latin ad lapidem.

PARASITES. PLANTS are those which grow upon the living parts of other plants, from whose juices they derive their nutriment, a circumstance by which they are immediately distinguished from false parasites, or epiphytes, which merely fix themselves upon other plants without deriving food from them.

Parasitic plants, properly so called, are extremely nu-

merous, and belong to various parts of the vegetable king-

dom. Some attack their victims externally, others are in-

sidiously introduced into the interior, where they flourish until they pierce the skin, place or pulp of the victim, or force their way into the body to the interior air, and disseminate themselves; hence, physiologists divide them into intestinal and super-

ficial. The former are exclusively fungi, and appear under the forms to which the popular names of mildew, rust, smut, &c., are applied; it is among these latter parasites of so many different kinds are met with. These are again divisible into such as have true leaves, green, and capable of acting, in the manner of ordinary leaves, as organs of respiration and digestion; and such as have scales, brown or black, on the surface, and in the root, from which grow out no powers of digestion or assimilation, except in a low degree. The first, or leafy or green parasites, elaborate their food for themselves; the second, or soley or brown parasites, obtain it in a state of elaboration from other species.

The production of such a plant, as far as is yet known, is generically the Viscum and Laurus. The viscid seeds of these plants strike root upon any solid body on which they fall; if it is not suited to support them, as in the case of stones, rocks, or any inorganic substances, they perish. (Vol. XVII. 21.)
soon perishes; but if it is capable of yielding them nutrition, as the leaf or branch of a tree, the young root immediately extends from the discs firmly to the surface, and by degrees introduces itself into the interior so as to place itself in communication with the fluid contents of the plant on which it has germinated. In general it is a matter of indifference to such parasites as "white" parasitical forms. As in the case of Stachys, the whole plant is covered with the "roots" or "rootlets," firmly to the surface of the plant on which they have grown. The "roots" of the Stachys, however, do not grow the same characteristic of the "roots" of the Stachys, and the "roots" of the Stachys, which are thin, are in fact not very different in its nature in different trees, seeds, and when it is in that state conveyed for the use of the parasite. The same author states, with reference to this point, that if a branch of mistletoe is plucked by the lower end into water, the mistletoe causes the absorption of water, just as the leaves would of the plant itself. Such plants as these are sometimes very injurious to the health of the trees on which they are rooted, and by robbing them of the food intended for their own leaves and fruit. When this happens, abscission is the only known remedy, and if carefully followed up, it must be successful.

Brown scale insects always attack the roots of plants, and when their underground habits have caused them to be little examined. The most common species in Europe are various kinds of Orelanches, which attack hemp, clover, lucern, and many other crops; Monotropa and Lathraea, which infest the roots, the first of the fire, and the second of the field, and in other countries Rhizanthus abound (Rhizanthus), and probably many others of which we have no sufficient knowledge. To these are usually added Neottia Nidus Avis and Corallorrhiza innata, two orchidaceous plants, concerning which we have but very few positive information. The best account of the manner of growth of brown parasites is by Mr. Bowman, who studied with care the habits of Lathraea squamaria. In that plant he found that the fibres of the roots are each tipped by a tubercle about as large as a pin's head, which attaches itself to the roots of the sub-tree, and gradually buries itself in the bark until it gets into communication with the wood from which it derives its nutrition. One of the most remarkable peculiarities of such plants as these is the constant absence of all green growth exposed to the slightest light. The branches grow in pastures and open places, and yet their scale-like leaves indicate no visible tendency to any colour except brown or purple; and in Lathraea Mr. Bowman has shown that the same thing always happens, although the plant grows without any growth of a green tissue at all. Connected with this is another curious property, that of resisting the attraction of light, towards which all the green parts of plants irresistibly tend; in Lathraea, when the flower stems have acquired their full stature, they are always perpendicular, and in groups of 20 or 30; in the most unbrageous situations the rows of flowers, which have always a unilateral direction, are as frequently turned from the only side on which light is admitted as towards it.

In addition to these superficial parasites there are numerous species more or less frequent great roots among the plants on which they prey. Rhizoctonia crocorum seizes upon the bulbs of the saffron in the warmer parts of Europe, and spreading its long flexible arms around them, robs them by degrees of all their vital fluids. Many other species have been noticed.

(For detailed information concerning parasitic, see Bowman, in the Transactions of the Linnean Society, vol. xvi. p. 399; and De Candolle's Physiologie Vegetale, p. 140.)

PARASITES SAGEURS. M. Milne Edward's name for a legion of his subclass Crustacea Sucrens. The Swimming Parasites consist of the orders Siphonostomes and the Lernaeus. In the same subclass are placed the Parasites Marcheuses, or Walking Parasites, consisting of the order dromaires. [SUCTORIAL CRUSTACEANS.]

PARCE (Melus), the Fates, were goddesses who were supposed to preside over the destinies of men. In Helaine we only read of one deity, Melusine, whose dooms even if they were not "righteous" were infallible. But in Helaine all succeeding poets read of three Fates: Clotho (Klotho), the "Spinning," Lachesis (Aphesis), the "Distributor," and Atropos (Atropo), the "Unchangeable." In one passage Helaine (Theog. 704), in speaking of the Fates, says: "They are three sisters, Clotho, Lachesis, and Atropos; the former (Theog. 217), the daughters of Night, which agrees with the statement of Cicero (De Nat. Deor., i. 17), who makes them the daughters of Night and Darkness (Kerubus). This contradiction seems to have arisen from the different notions entertained by the ancients respecting the relative power of Zeus and the Fates, since they were sometimes represented as ruling the gods and Zeus himself, and at other times as merely carrying into effect the determinations of Zeus. In the ancient Greek writers, and especially Homer, the Fates are said to have been the "daughters of the gods that are subject to the decrees of fate"; but in later times the Fates appear to have been generally regarded as subject to Zeus.

Thus we learn from Pausanias (v. 16, s. 4; s. 24, s. 4) that Zeus was worshipped both at Olympia and Delphi under the name of Melpomene, or "Irmata, the daughter of the Fates," which title was also applied to Apollo at Delphi. (Paus. x. 24, s. 4.) Pausanias, in describing (t. 40, s. 3) a celebrated statue of Zeus at Megara, on the head of which the Fates (Melpomene) were placed, remarks that this was done because "destiny (ρομη) of the thing is in nature." The Fates are usually spoken of by the Greek and Roman poets as spirits who presided over the destinies of men (II. xx. 126; Od. vii. 197); and according to mythologists, each of the three presided over different periods of human life; Clotho over the "period," Lachesis over the "course of life," and Atropos over the "course of the life of each individual." Apuleius (De Myn.; p. 330, Bippont), whose opinion however may scarcely be regarded as representing the popular belief upon the subject, assigns a different office to each of the Fates. Atropus is regarded as having been the last, Lachesis, of future, and Clotho of present events.

There was a temple at Laodamone sacred to the Fates (Paus. iv. 11. s. 8), and there were also altars sacred to them in the neighbourhood of Sicyon. (Paus. ii. 11. s. 4.) These altars were placed in the eleventh district (region) of the city (Geophr. Panv. apud Rosin., i. c. 13); but their worship seems to have prevailed at Rome to a very small extent.

PARCENERS, or COPARCENERS, are so called because the lands of which they are parceners may be partitioned or divided among them. There may be parceners by common law and parceners by custom.

As to parceners by common law, if a man dies intestate seized of lands in fee, and leaves only daughter, the lands descend to her as her dower, even to the greatest extent of being the heir apparent. If she dies it will pass to his next heir, and if she be no heir, the lands will descend to his son. The descendent is the same if a man dies seized of lands in tail, except when the estate tail was limited to such man and the heir of his body, for in that case the lands can only descend to those who are heirs of the body. In all cases where several females take one inheritance by descent, they are called parceners, and all lands or tenements, including a rent charge, net descend in this manner. If there be no heir of the body, the lands descend to his heirs as next of kin, and a title of dignity is not in its nature derivable from the dignity therefore will be in abeyance. (Bacon, p. 488.)

The descent of the crown is an exception to this rule; for if there are several daughters, &c., and no male heir, the crown with all its rights descends to the eldest female. In this case the eldest female, called the "Crown Matron," undertakes to pay the debts, the parceners, or persons in her stead, as parceners, the office was executed by the husband of the eldest daughter, and, before her marriage, by deputy.

Parceners resemble joint tenants in having a unity of title and one entire freedhold; but the unity of title can only be broken by death, and there is no division of their lands if one of them dies, her heir is parcener with the survivors. Parceners resemble tenants in common, in having each a moiety or several interest in the land which has descended to them. It follows from the nature of this interest, that one parcener may either enfoul another co-heir or release her share to such parcener. If
A parsoner aliases her undivided share before partition, the alms is taken in common with the other parsoners.

Parsoners may voluntarily make partition of the land among them; or any one might formerly compel her coparsoner to make such division by a writ entitled de partitione faciendo, which was also applicable to the case of joint tenancy. The Act of Chancery in course of time acquired a jurisdiction in these cases, and a bill may be filed in chancery by a parsoner, praying for partition, which prayer will be granted on the parsoner making out her title. The partition is effected by issuing a commission out of chancery to commissioners, who set out and divide the lands, upon which the parties show conveyances. When partition is made, the several parsoners hold their lands as several and distinct estates. Since the abolition of the writ of partition (3 and 4 William IV, c. 27), partition can only be effected by a suit in equity.

Coparsonery may exist among males and females. For instance, if a man has two daughters, and one of them dies in his life-time, but leaving a son and daughters, and then the father dies, the son of the deceased daughter will be coparsoner with his aunt; for he must trace his descent through his mother, who, if she had survived her father, would not have been his heir, but together with her sister, who did survive the father, would have made his heir.

Linen material; we find it mentioned that Guis, count of Nevers, having sent a valuable present of linen to the king of Paris, the unostentatious monks returned it with a request that he would send them partition instead. It had long been customary to erase antient writing from partition instead. When linen was used, it began we do not know; Muratori cites a palimpsest of Bede near only nine centuries old, and some have since been found of still more antient date. [PALIMPSEST; GAIUS.] The practice was so common in the fourteenth and fifteenth centuries, that when the emperor of Germany exercised the creation of an imperial notary, one of the chief articles of his diploma was that he should not use scraped vellum in drawing deeds. But the invention of linen paper came in aid to the uses of parchment, and when its manufacture became cheap, it took the place of parchment costly and for all purposes except those in which luxury was aimed at or uncommon durability required.

PARDALOTUS. [Piprinae.] PARDON. According to the laws of most countries, a power of pardoning, or remitting what may be the penal consequences of a conviction for crimes before the judicial tribunals, is vested in the sovereign or in the chief magistrate. The utility of such a power has been doubted by juridical writers, upon the ground that it supposes an imperfect system of criminal law, by which an error is not always corrected, and the existence of an error either in the law itself or in the administration of justice. (Becarria, chap. 46.) There is no doubt that the nearer a penal system approaches to perfection, the fewer will be the occasions for resorting to extrajudicial remissions of the execution of the law; or considering the numerous causes of erroneous decision, arising not only from the imperfections of laws themselves, but from the infinite sources of error in the instruments and means by which they are administered, it seems to be desirable that some power should exist which may timely interfere prevent the occurrence of irreparable wrongs in cases where the error cannot be corrected by any appellate tribunal. At the same time it is evident that such a power should be circumscribed and defined, as far as its nature will admit, and executed with the utmost caution. In this respect the power of besides pardons by act of parliament, the power of granting pardons for crimes is exclusively vested in the king as a branch of his prerogative. [PREROGATIVE.]

Formerly, Counts Palatine, Lords Marchers, and others were granted by virtue of the pardon from the crown, assumed the authority to pardon crimes; but by the stat. 27 Henry VIII., c. 24, this power was entirely abolished, and the sole right of remitting the sentence of the laws was permanently vested in the king. The power of remitting all cases was never before either concerned in interest or prosecutes for the public. The only exception to this rule is contained in the Habeas Corpus Act (31 Car. II., c. 2, s. 12), by which persons convicted of signing commitments of British subjects to foreign prisons are declared to incur the penalties of a treasonable act and to be incapable of any pardon from the crown.
The crown has however no power to pardon any offence in the prosecution of which a subject has a legal interest, or, as Bacon expresses it, 'non potest rex gratiam facere cum injuriis et damnis aliorum' (lib. iii., p. 132). Thus in appeals of death, robbery, or rape, the king could not pardon the defendant, 'because,' says Sir Edward Coke, 'it is the suit of the people against the prisoner' (ibid., 337). But, on the same principle, where an attaint was brought against a jury who had delivered a false verdict, and the party in whose favour it had been given was joined in the attaint, the king might pardon the jury, if convicted, because they were merely subject to an ex delicto punishment; but he could not pardon the party, because the latter was liable to make restitution to the plaintiff who prosecuted the attaint. So also in indictments for common nuisances, where the public are interested as individuals or particular classes, or individual local statutes declare the penalties to be the penalty as well as the crime. If, therefore, part of it goes to the informer, or the party grieved, the crown cannot pardon the offender. Formerly, the crown appears to have exercised without restriction the power of pardoning offenders impeached by the Commons in parliaments, and even before the assertion of their rights, in 1588, on the authority of a statute not extant (Tytleton's Notes); but the lawfulness of the exercise of this power during the pendency of the proceedings was questioned by the House of Commons on the impeachment of the Earl of Danby in the reign of Charles II. (H. J. Gardiner, The State Tryals, vol. ii., pp. 23, 24). In the Act of Settlement, 12 and 13 William III., c. 2, it was enacted 'that no pardon under the great seal of England shall be plenteable to an impeachment by the Commons in Parliament.' This statute however does not affect the power of the crown to pardon the offender after he is found guilty upon the impeachment, and the proceedings are determined.

An effectual pardon from the crown must apply in express terms to the particular offences intended to be pardoned, and there must be no reasonable intendment, supplied by the nature of the thing, or in any other way, that the crown was deceived or misled as to any of the circumstances on which the grant was founded. Nor can any grant of a commission or permission by the king amount by implication to a pardon of an offence previously committed.

A pardon may be either absolute or subject to any condition which the crown may think proper to annex to it; and in the latter case, the validity of the pardon will depend upon the performance of the condition. Until the recent improvements in the criminal law of England, all felons were nominally capital; and in the numerous cases where it was not intended that the sentence of death should be executed, the criminal obtained a pardon upon condition of his submitting to transportation or some other punishment. The difficulty of present day is that the crown may offer to mitigate or commute a sentence, the mode by which it is effected being by granting a conditional pardon.

It was formerly necessary that every available pardon from the crown should be under the great seal; but by the statute 35 & 36 Car. II. c. 52, s. 13, it is enacted 'that where the king's majesty shall be pleased to extend his royal mercy to any offender convicted of any felony, punishable with death or otherwise, and by warrant under his royal sign manual, countersigned by one of his principal secretaries of state, shall grant to such offender either an absolute or conditional pardon, the discharge of such offender in the case of a free pardon, and the performance of the condition in the case of a conditional pardon, shall have the effect of a pardon under the great seal.'

A pardon of such a pardon is not merely to prevent the infliction of the punishment denounced by the sentence upon the offender, but to give him a new capacity, credit, and character. A man attainted of felony ceases to be probus et legis homo, and can neither bring an action for damages nor be a witness or a juror in any legal proceeding; but upon receiving a pardon, all these legal disabilities are removed. In this respect a pardon by the law of England differs from the abribo of the Roman law, to which in other points it bears a near resemblance. According to the latter, 'Intulenta, has liberal, note ne inamiam criminis tollis, sed potestiam gratiae.' (Cod., lib. ix., tit. 43.) By the English law a distinction is made as to the effect of a pardon where the incapacity is part of the legal sentence, and not merely a consequent punishment attendant on the case of perjury under the statute 5 Elizabeth, c. 9, where the incapacity or infamy is part of a statutory sentence, a pardon from the crown has been held not to restore the party, and in such a case nothing less than an act of parliament will have that effect. (Chitty's Criminal Law, vol. i., p. 776.) Some doubt has been expressed, and the point has not yet received a judicial determination, whether a royal pardon will fully restore a person convicted of a crime, such as perjury, which is considered infamous at the common law, and the courts have carefully examined in Mr. Hargrave's Argument on the Effect of the King's Pardon of Perjury (Hargrave's Judicial Arguments, vol. ii., p. 221).

PARE'S, AMBROSE, the first and most eminent of the French surgeons, was born in 1529, at Le Havre, in the province of Maine and the modern department of Mayenne. His parents were poor, and his education was neglected, but having one day witnessed the operation of lithotomy, he went immediately to Paris and commenced the study of surgery and anatomy. He successfully resisted the attacks of his enemies during several campaigns in Italy, and gained so much reputation, that in 1522 he was appointed surgeon in ordinary to king Henry II. He held the same office under Francis II., Charles IX., and Henry III., until his death, at the age of seventy, in 1585. He was a pious and excellent man, and having been educated in the reformed church, he steadily refused to leave it. During the horrible massacre of St. Bartholomew's, he offered his life to his professional reputation and the people's friendship, but his life was saved, not by purely personal motives, but by having saved from the consequences of a wound accidently inflicted on the median nerve in venesection. (Opera Chirurg., lib. ix., cap. 38.) Banomato says, in his Memorials, that one night he sent for him to his bed-room, and told him not to stir out, saying that it was not right to murder a man who was so useful to the world (tom. iv.). The French writers justly consider Paré to be the father of modern surgery, and say that he holds the same rank in this branch of the profession as Hippocrates did in medicine. He was not satisfied with blindly following the precepts of his predecessors, but by diligent observation and reflection made several important changes in the mode of treatment, which have been followed with success by all succeeding surgeons. A good example of this, was in the treatment of gun-shot wounds, into which it was the custom at that time to pour boiling oil; he was also the first person who left off the barbarous practice of cauterising a limb to stop the hemorrhage after an amputation. He was the author of several other editions of his whole works, which have also been translated into Latin, Paris, 1582, fol., into twenty-six books; into English, London, 1578, fol.; into Dutch, Leiden., 1604, fol.; and into German, Frankf., 1604, fol. (Sprengel, Hist. de la Méd.; Haller, Biblioth. Chirurg.)

PAREDES, DIEGO GARCIA DE, a celebrated Spanish general, not undeservedly called 'the Spanish Bayard,' was born of noble parents, at Truxillo, a town of Extremadura, in 1466. Having early embraced the career of arms, he accompanied his father to the war of Granada (1485), and was present at the taking of Bassa, Velez, and Malaga from the Moors. (Ferdinand: Moors.) It was there that he became acquainted with the celebrated Gonzalo de Córdova, under whom he afterwards served in Italy and France. Shortly after the taking of Naples (1494), he left his native town, determined to repair to Italy, then the theatre of war; but as he had neither horse nor armour, he stole a horse concealed under his father's house. Scurrying however he had proceeded a few miles on his way, when he was overtaken and attacked, by seven of his cousin's squires, of whom he killed two.
wounded two more, and put the remainder to flight. On arriving at Rome, he was well received by the Pope (Alexander VI.), who gave him a high command in his army. He made no surprise, and declared that he knew nothing of it. On this service fell on his knees and begged the king to obtain his pardon of his master for having presumed to practise the art without his permission. Philip, being much pleased at this address and admiring a work produced under such singular circumstances, told Velasquez to give a man who showed so fine a genius and possessed such talents no longer to be a slave. Velasquez, of course, immediately emancipated him. But he never quitted his master, and after the death of Velasquez continued to serve his daughter with the most fidelity.

He was especially successful in painting portraits, which in style, colouring, and handling so exactly resembled the works of his master, that we are assured they could not be distinguished from them.

PARELLA. (Sometimes written Parella), the French name of a crustaceous Lichen, Lecanora Parella of botanists, but which is applied to several species similar to it in habit, and employed for the same purpose, that is, for yielding a rich dye known by the name of litmus. The mode of preparing this is said to be by boiling the wrong for some hours with water, with the addition of lime-water, when it acquires a violet colour and is changed into a soft pulp. It is used for staining, and also for making a pink obtained by moulding its molten parts, as seen in commerce. M. Guibourt is of opinion that the colouring matter is given by Crouspora tinctoria, or torula; this may be the case sometimes, but there can be no doubt that not only the parella but several other species of lichens are called by this name; for what other purpose do they form articles of commerce? In France even, several other species are employed, as well as the parella, which is especially called parelle d’Auvrenge. In the Channel Islands these species serve the rocks for this lichen, which is said to be often intermixed with Lichen (now isidium) corallinum, which is endowed with similar properties. De Candolle indeed states that most of the lichens with a crustaceous thallus are possessed of dyeing properties, and, therefore, the coloring matter is procured at the author of Ramond, that with the above, Varioloria orcin, dealbata, and aspergillia, with Lichen geographicus, teresposus, and sulphureus, are employed in preparing litmus. We know indeed that in Great Britain several species have been used for dyeing, and at the ends of the vats of wool, which are brought into extensive employment by Dr. Cuthbert Gordon, who took out a patent for his process, converted his Christian name into Cudbeer, and applied it to the dye-stuff employed to produce purple for dyeing woolen yarn. The parella is sometimes substituted, and especially of a great request, and bring higher prices than ever, from their increased scarcity.

PAREYNA. The term which was applied by the old anatomists to an imaginary substance, through which they at the same time supposed the colouring matter to be strained. Even after the discovery of the circulation, the mode in which the blood passes from the extremities of the arteries to the beginnings of the veins remained for some time unknown. Harvey seems to have been the first who advanced the hypothesis that there were just preceding him, who believed that there were wide passages of communication between arteries and veins, and that of the more antient authors, who spoke of a parenchyma, or spongy substance, a concrete blood, and that they supposed they were the means to render Harvey’s demonstration of the circulation of the blood perfect.

In the present day the term parenchyma is rarely used. If it had any definite meaning at all, it may be considered to express all that part of an organ or of a gland, which lies in the interstices of the blood-vessels and be-
tween the secreting ducts, that is, the common cellular tissue by which the more essential parts of organs are connected together.

**PARENT AND CHILD.** This relation arises only from a legal cause. The relation between parents and their illegitimate children is considered in the article **BASTARD**.

Parents are bound to maintain their legitimate children who are unable to maintain themselves owing to infirmity or inability to work. This obligation extends to father and mother, grandfather and grandmother, if they are able to perform it (43 Eliz., c. 2). But such persons are only bound to furnish the children with the necessaries of life; and the penalty incurred in case of refusal is only 20s. per month. A husband is now (4 and 5 Wm. IV., c. 76) liable to maintain the children of his wife, born before marriage, whether they be legitimate or not, until they are of the age of sixteen, or until the death of his wife. If a parent deserts his children, the churchwardens and overseers may seize his goods and chattels, and receive his rents, to the amount mentioned in the justices' warrant, which must be obtained before such seizure is made.

If a Papist parent refuse to allow his Protestant child a suitable maintenance, with the view of compelling him to come over to the Roman Catholic religion, the lord chancellor is empowered to issue a proper allodium (11 and 12 Wm. III., c. 4); and if Jewish parents refuse to allow their Protestant children a maintenance suitable to the parent's fortune and the age and education of the children, the lord chancellor, on complaint being made, may make such order as he shall think proper (1 Anne, st. 1, c. 30).

Parents are not bound to make any provision for their children after their death. Every man and every woman who is capable of disposing of her property by will, may dispose of all and any part of her estate as she shall think fit. An act of 16 Geo. III. is said to give to a freeman of London who is under some limitations as to the power of disposing of his property by will, which limitations are in favour of his wife and children. If a parent or child may aid each other in a law suit by paying fees, without being guilty of malpractice, and are not to meet costs.

Parents are not legally bound to give education to their children, nor are they under any restrictions as to the kind of education which they may give. Certain penalties were imposed by statute (1 Jac. I., c. 4; 3 Jac. I., c. 5) on a person who sent a child under his government beyond seas, either to prevent his good education in England or for the purpose of placing him in a Popish college or being instructed in the Papist religion; and further penalties and disabilities were imposed both on the person sending and the person sent (2 and 3 Geo. III., c. 30). It is said that the Act intended to repeal these penal and disabling statutes by the 31 Geo. III., c. 32, in favour of any Roman Catholic who took the oath therein prescribed; and probably these statutes may be considered as repealed.

The maintenance of a child over his children continues until the age of twenty-one, when they are emancipated; and if a parent die leaving a child under age, he may appoint a guardian to such child till the age of twenty-one, by a will executed pursuant to 1 Vic., c. 26. A mother has no power over her children. A person under age, except a widow, or widow, cannot marry without the father's consent, or such consent as required by the Marriage Act. [MARRIAGE, p. 441.]

A child under age may acquire property by gift; and if a father give an estate to his child, he must account to the child when he comes of age, like any other trustee. So long as a child who is under age lives with and is supported by the father, the father is entitled to receive the reward of the child's labour. When a child has a fortune of his own, and the father is not able to maintain him suitably to such fortune, a court of equity will allow the father a competent sum for maintenance out of the child's estate; but the father is not entitled to any such allowance in respect of costs incurred by him for his child's maintenance before he has obtained the use of court for such maintenance.

A parent may maintain an action for the seduction of a daughter on the ground of loss of her services, if there is evidence of her acting in the capacity of servant, or living with the parent in such a manner that the parent had a right to her services. This action has been maintained by a father in the case of his daughter, a married woman above age, living separate from her husband, and with the father; and by an aunt for the seduction of a niece living with her, to whom she stood in the relation of parent.

The foundation of the right to maintain such an action is the loss of the services to which the parent is entitled. In allowing such an action therefore in the case of a child above marriageable age married without the consent of the court, endangers the morals of the children. Percy Bysshe Shelley was, among other things, restrained by an order of the court of chancery from taking possession of the persons of his infant children, on the ground of his proceedings in regard to the marriage of his children. W. P. T. L. Weilasc was also restrained by a like order from removing his children from the care and custody of their aunts, on the ground of his immoral conduct, and directions were given by the court for the custody and education of the children. But, except in such cases as these, the children cannot be taken from the care of the father and given into the custody of the mother or any other person.

Under a recent act (2 and 3 Vic., c. 54) a mother who is separated from her husband by death or divorce, may by order from a court of equity for access to her child which is in the sole custody of the father, or of any person by his authority, or of any guardian after the death of the father, subject to such regulations as the judge may think consistent with just; and if such child shall be within the age of seven years, the judge may order the child to be delivered into the custody of the mother until the child attains the age of seven years, subject to such regulations as are made. But no mother has to have the benefit of the act unless the judge, by judgment, in an action at law, or by the sentence of an inquorate court.

The relations between parent and child which are not founded upon the parental power, but arise in respect of the child's property, were governed by statutes. The act of 18 Geo. III. created an independent court of equity, to determine these cases, on the occasion, and in respect of purchases by the parent in the name of the child, belong to various heads or titles of the law of property, inasmuch as the rights and claims of other persons besides parent and child are involved in such cases.

A child who is under the parental power owes obedience to his parent, which the parent may enforce by his superior strength, provided he uses it with moderation. He may consent to the child and restrain his liberty, but not in such a manner as to prevent the child from maintaining his indigent father and grandfather, mother and grandmother, if he is able; the penalty in case of refusal is 20s. per month.

The Paternal Power (patria potestas) among the Romans was a power of jurisdiction in their institutions. It was founded on a legal marriage, or on a legal adoption: the children of such marriage and such adopted children were in the power of the father; the mother had no power over the children. It followed from the principle of the patria potestas, which involved a right of property, that the children of a son, or emancipated, were also in the power of their grandfathers. By the death of the grandfather the son became sui juris, and his children and grandchildren fell into his power. The patria potestas could also be dissolved by Emancipation. According to the father, who had no independent political existence, at least as a member of his family's house. He was a Roman citizen, but at home he was subject to the domestic tribune. Within the family the father had a power of life and death, and could sell the son as a slave, either by way of punishment, or by way of dissolving the family connection. [EMANCIPATION.]

The father also originally possessed the jus novae dandi with respect to his son as well as a slave, a power which was a consequence of the principle of the patria potestas: the son did not possess the power of the descendant as long as that principle was in full vigour. The son who was in the power of his father could acquire no property for himself; all his acquisitions, like those of a slave, belonged to his father; but at the death of the father they might become his own property, a circumstance which distinguished the acquisitions of a son from those of a slave. The father could marry his children, divorce them, give them in adoption, and emancipate them at pleasure.
The strict notion of the patria potestas lies at the foundation of the Roman polity. Like other institutions however, which in the early history of a state form its essential elements, the patria potestas became gradually relaxed and greatly changed. The history of such changes is a part of the history of Rome.

The patria potestas might be dissolved in other ways besides those mentioned. If a father or son lost his citizenship, the relation between them ceased, for the relationship cannot exist between Roman citizens. If a father was made a prisoner by an enemy, the relation was in suspense, but was not extinct. If the son attained certain high offices in the state, either civil or religious, the patria potestas was suspended.


PARGA, a town in the province of Albania in European Turkey, on the coast of the Ionian Sea, opposite the island of Paxo, which is 12 miles distant, in 39° 37' N. lat. and 20° 18' E. long. This place is first mentioned in the fifteenth century, when, amidst the wreck of the Eastern empire, the inhabitants of Parga sought safety in the protection of Venice, and became voluntary subjects of that republic. A notable event, associated with the name of Parga, subject to the Venetian governor-general at Corfu, and commanded the garrison, which consisted of a company of Pelasgian or Italian troops, in the pay of Venice. The Pargianotes however had their own municipal council, which appointed the magistrates and regulated the affairs of the town.

These settlements were Butrinto, Parga, Prevesa, and Vonitza in the Ambracian Gulf. They had each a small territory, which was guaranteed from Turkish intrusion by treaties between the French government and the emirs of the Ionian islands; and the further protection of the Ionian islands, sent small garrisons to each of these towns to replace the Venetian garrisons. But the invasion of Egypt by Bonaparte, in time of profound peace with the Porte, threw the latter into the coalition then forming against France, and a treaty was concluded in December, 1798, between Russia and Turkey, by which the two powers agreed to join their forces by sea and by land against the common enemy. The Turco-Russian fleet and army accordingly attacked the Ionian islands, and took them from the French government. The time Ali Pasha attacked the French garrison of Prevesa, and massacred it with circumstances of great atrocity. He likewise invaded Butrinto and Vonitza, from which the French had withdrawn, as well as from Parga. Parga however was not attacked by name, and being besieged by Ali to submit, boldly refused. In March, 1800, a convention was agreed upon between Russia and Turkey, by which the Ionian islands were constituted a republic, under the protection of the Porte and the guarantee of Russia. An article 7 of the same convention it was stipulated that 'the former Venetian possessions of Butrinto, Prevesa, Parga, and Vonitza, which are on the continent and contiguous to Albania, shall belong in future to the Porte, but the inhabitants of those places be granted by the Turkish commission the privilege of remaining hereafter as free subjects, without tax or tribute than they used to pay to Venice; the inhabitants shall continue to be administered according to their own laws and usages, shall retain the free exercise of their religion, and no person shall acquire any property within their limits, without the exception of the commission.' By article vii. of the same convention the emperor of Russia promised to use his endeavors, in the event of a general peace, to cause the stipulations of the present treaty to be accepted by the Porte in the Ionian islands, Reetos, and Paxo.

To the unfortunate surviving people of Butrinto, Prevesa, and Vonitza, who were already in the grasp of Ali Pasha, who had treated them with great cruelty, this convention was a boon, by giving them a claim to some sort of protection. Parga however was still free and having taken a time refused to submit, being threatened with imminent destruction from the numerous forces of Ali Pasha, they sent a deputy to Constantinople to request the interference of the Porte, and through the influence of the minister of the republic of the Ionian Islands, supported by Russian influence, the divan sent them a boy to reside among them, thus fulfilling the stipulations of the treaty, and at the same time protecting them against any encroachments from Ali. Parga maintained in this state of nominal subjection to the Porte till 1806, when war broke out between Russia and the Porte. Ali Pasha took this opportunity of taking military possession of Prevesa, Butrinto, and Vonitza, and dealing with the inhabitants as he pleased, and again the stipulations of the convention of 1800. Those of Parga, fearing the same fate, applied for protection to the Russian admiral on that station, who sent them a garrison.

By the treaty of Tilsit, in 1807, the Ionian Islands being given up to France, the Russian troops which were stationed in them withdrew, including the detachment at Parga. Ali Pasha now renewed his efforts to take possession of Parga, and applied to the French governor-general at Corfu for the formal cession of that place. That officer however refused, and sent a reply that they would be attacked, having already driven the French out of the Ionian Islands, with the exception of Corfu, and placed a garrison in the island of Paxo, which lies in sight of Parga. Ali Pasha sent a considerable force against Parga, which invaded its territory, took some of its posts, and made it a garrison. Those of Parga, fearing the same fate, applied for protection to the French general at Corfu, having already driven the French out of the Ionian Islands, with the exception of Corfu, and placed a garrison in the island of Paxo, which lies in sight of Parga. Ali Pasha sent a considerable force against Parga, which invaded the territory, took some of its posts, and made it a garrison. Those of Parga, fearing the same fate, applied for protection to the French general at Corfu, having already driven the French out of the Ionian Islands, with the exception of Corfu, and placed a garrison in the island of Paxo. The French general at Corfu, having already driven the French out of the Ionian Islands, with the exception of Corfu, and placed a garrison in the island of Paxo, which lies in sight of Parga, applied to the French at Paxo, in March, 1814, and offered to host the English flag, and master the French garrison, if the English would take them under their protection. As General Campbell, who commanded in the Ionian Islands, sent a detachment with two frigates, at this time, the English having surprised the citadel and hoisted the English flag, the detachment was landed, and took possession of the fortresses on the 22nd of March, and the French garrison was sent to Corfu. (Colonel de Bisset, Proceedings in Parga, 1814, with a Series of Correspondence and Despatches.)

The future condition of the Ionian Islands remained to be settled by the great powers assembled at the congress of Vienna. A convention, agreed upon between the courts of Great Britain, Russia, Prussia, Austria, and France, was signed on the 5th of November, 1815, by which the isles of Corfu, Zante, Cefalonia, Santa Maura, Ithaca, Cephalo, and Paxo, with their dependencies, were designated in the treaty between his majesty the emperor of all the Russians and the Ottoman Porte, concluded on the 12th of March, 1806, by which they were constituted an independent state under the protection of the crown of Great Britain. By article viii. of the same convention the Ottoman Porte was invited to accede to its stipulations. The Porte, being applied to, demanded as a preliminary to the ratification of the convention, the formal cession of Parga. After some lapse of time, an agreement was entered into at Constantinople into which the English minister and the divan early in 1817, for the delivery of Parga to the Porte, under the condition that those inhabitants who might choose to go in 1814, the bey says, having surprised the citadel and hoisted the English flag, the detachment was landed, and took possession of the fortresses on the 22nd of March, and the French garrison was sent to Corfu. (Colonel de Bisset, Proceedings in Parga, 1814, with a Series of Correspondence and Despatches.)

The population of Parga at the time was stated by the English commandant, Colonel de Bisset, at 800 families, making 3040 individuals in all. The olive-trees belonging to them amounted to about 81,000. The landed property and houses were roughly estimated by Col. de Bisset at about 400,000 livres, and the estimate and payment of the property was protracted for nearly two years through the cavils of the Turkish commissioner, and the intrigues of Ali Pasha, who wished to obtain Parga without paying the money. Ali tried every means to excite the inhabitants of Parga to acts of violence, by which they might forfeit the English protection, but the good sense of the Pargianotes and the steadiness of the British authorities disappointed his cunning. At last, in May, 1819, the whole population of Parga emigrated to Corfu, and the property was declared to be vested in the Porte.
barked in English vessels, having received the valued amount of their property, 150,000l., and were settled at Pajo and Corfu. The Turks then occupied Parga. (Letter from a Greecean Traveller respecting the Intended Crossing of Parga, London, 1819.)

The cession of Parga has been treated by several writers as a question of feeling rather than one of strict diplomacy, and has been made on the Continent the topic of much discussion. In England, both in the papers and in private, one act of injustice is often the leader of a long train of woful results. A liberal Italian writer, Count Pechio, in his "Life of Foscolo," &c., frankly acknowledges that the cession of Parga was obligatory upon the English in fulfilment of former engagements. Bayley admitted that the island could not mitigate its hardships upon the inhabitants, considering that they had to deal with such a man as Ali Pasha; and Foscolo, by birth a Greek, after writing a big book on the subject, perceived his mistake just in time to stop its circulation.

The town of Parga stands on a rock forming a small peninsula. It has two ports, one of them antiently called γάλινη λίμνη, 'the port of sweet waters,' now Port Veletic. The town has narrow streets; the summit of the rock is almost impregnable. It is surrounded by a fertile territory, and the townsmen export oil, tobacco, fruit, and tolerably good wine.

Parhelion (παρείλιον, by the side of, παρά, the sun), a name given to the mock suns, as they have been called, which sometimes appear near the sun; being, as is supposed, images of the latter formed by reflection from a cloud.

Palia, the Gulf of, extends between the island of Corfu and the continent of South America, and has received its name from the adjacent portion of the continent, which was once called Paris, a name afterwards superseded by that of Cumana. The gulf extends about a hundred miles, from 61° 30' to 63° W. long. It has nearly the form of a quadrangle, whose longest side lies east-north-east by east and west-south-west by west, and is about 30 miles across.

A hilly promontory, projecting from the continent of South America more than 70 miles, separates the gulf from the South Sea, and terminates in an east-west cape, called Punta de la Peuna, which is also called Cape Paria. Opposite this cape and about 20 miles from it is the most northerm point of the island of Trinidad. This opening contains four straits formed by three rocky intervening islands, called the Eastern Island, the Central Island, and Dragon (Dragon's Mouth), the widest, and about 6 miles across. There are several rocky islands in it towards the Punta de la Peuna, but as all of them are above the water, they are easily avoided. The rocky island east of it is called the Great Island, and the Ile de Huesos (Isle of Egges) is the second strait, called Ship Channel, which is only two miles wide. This channel, which bends south-eastward, is used by vessels leaving the gulf, but not generally by those that enter it, as the current sets outward and is strong. Between the Ile de Huesos and the Ile mona (Isle of Apes) is the Nuevo Channel, which is somewhat wider than the preceding, and is more used by vessels entering than leaving the gulf. The Monos Channel, between the Ile de Huesos and the north-west point of Trinidad, on the narrowest, and the current in it is the strongest. It is only navigable by small vessels. As the current runs through all these straits northward, the gulf can only be entered with a strong breeze.

Of the entrance of the gulf is between the rocky cape called Punta Iacono, in the island of Trinidad, and the low alluvial shores lying on both sides of the two most western of the mouths of the Orinoco, called Cano de Federnales and Cano de Manamo Grande. From these low shores a shoal extends nearly across the strait, which is called the Serpent's Mouth. Less than half a mile from Trinidad this shoal is dry at low water, and called the Ile de Soldado. Between this island and Trinidad is the narrow entry into the gulf, which can only be passed with a strong south-west wind.

The gulf itself may be considered as one of the most extensive and best harbours in the globe. It offers nearly everywhere excellent anchorage, especially along the coasts of the island of Trinidad. Its depth, except near the shores, varies between 8 and 9 fathoms, and the channels are free from rocks. It is only along the south-western coast that there are sandy shoals, which have from 3 to 5 fathoms water on them. The water is as salt as that of the Atlantic, though it receives a great volume of fresh water from the Orinoco which falls into it by the river Guaraquiche, which enters it not far from its western extremity. It is supposed that the current which seizes through the gulf in a northern direction is caused by the wind and the effect of the trade-winds. The tides also, which rise about six feet, run with great force.

(Depon. Voyage à la Partie Orientale de la Terre Perme, &c.: Lavayss's Description of Venezuela, Trinid., Martinique, and Tobago.)

PARIAN CHRONICLE as the name given to a block of marble presented at Oxford, which contained in its perfect state a chronological account of the principal events in Greek history during a period of 1318 years, beginning with Ceres., n.c. 1592, and ending with the archaisph of Diodorus, at Athens, n.c. 264. The chronicle of the last ninety years was wrong, and it is supposed that the parian was made at the archaisph of Diusimus, n.c. 334. This chronicle was purchased at Smyrna, together with several other relics of antiquity, by Mr. William Petty, who was employed by the Duke of Marlborough in making collections for him of antient works of art in Greece as Minor, and the islands of the Archipelago. Gassendi states in his "Lisso de Peirese" (lib. iv., ed. of 1629), who was consuls in the parliament of Provence, and a munificent patron of arts and sciences, that the Chronicle was first cut and covered by means of Peirese, and was purchased for him by one Sampson, his agent at Smyrna, for fifty pieces of gold, but that when it was ready to be sent on board, Sampson was thrown into prison, and that the Chronicle was afterwards purchased for Lord Arundel, by Mr. Petty, for the full market price, or rather higher price. Dr. Hales, in his "Analysis of Chronology" (vol. i. p. 103, 3vo, edition), brings forward several reasons to show the improbability of this account; but however this may be, the Chronicle reached London in 1627, and was purchased by the Earl of Arundel, for a fabulous price, by the assistance of glasses, and the critical sagacity of my very kind friend Patrick Young, after a great many repeated trials. I have restored them as well as I could. The Chronicle was published by Selden, together with other inscriptions which are not here noticed, under the care of W. R. Hales, in the year (1628), under the title of "Mormara Arundelianum." During the civil war in the reign of Charles I., the Earl of Arundel removed to Antwerp, and many of the marbles, which were deposited in the gardens of Arundel House, were defaced and thrown into the Thames. The latter was the fate of the Parian Chronicle; the upper part of it, containing at least half the inscription, is said to have been worked up in repairing a chimney at Arundel House, but fortunately a copy of it was preserved in Selden's works.

In 1667 the Hon. Henry Howard, grandson of the Earl of Arundel who obtained the chronicle from Greece, presented it to the university of Oxford, where it is preserved, together with other antiquities collected by the Earl of Arundel, under a room in the building now converted into the public library. The Arundelianum. The Chronicle was published again in Pro-deaux's "Mormara Oxiomnica," fol. 1676, which was reprinted in 1732, under the care of Michael Maittaire, and again, in 1829, under the care of W. R. L. Candler's "Mormara Oxiomnica," vol. 1763. Great pains were bestowed upon the Parian Chronicle, and many parts in which the inscription was defaced were supplied by conjectures, which are frequently very Inaccurate and probable. It has been published by E. H. the Rev. J. Roberton, under the title of "The Parian Chronicle," or the Chronique.
of the Arundelian Marbles, with a Dissertation concerning its Authenticity; London, 1788, in which it is maintained to be a fabrication of modern times. The principal objections brought forward by Robertson are: 1. That the characters have no certain or unequivocal marks of antiquity. 2. It is not probable that the Chronicle was engraved for private use. 3. It does not appear to have been engraved by public authority. 4. The Greek and Roman writers for a long time after the date of this Chronicle complain that there is no chronological account of the affairs of ancient Greece. 5. This Chronicle is not once mentioned by any writer of antiquity. 6. Some of the facts seem to be taken from authors of a later date. 7. Parachronisms appear in some of the epochs at which we are reckoned by the Greek chronologist in the 12th Olympiad would be likely to commit.

The objections of Robertson were replied to by Mr. Howlet, in a work entitled 'A Vindication of the Authenticity of the Arundelian Marbles,' 1790; and the ninth volume of the 'Archaeologia,' and by Porson, in the 'Monthly Review,' in 1789. His objections have been more recently noticed in the first volume of Hales's 'Chronology,' and the whole subject has been investigated with great accuracy by Mr. Geo. Chaloner, who has published a work upon it. The strongest argument against its antiquity, may be accounted for, as Mr. Hales has remarked, by the retired and insoluble situation of Paros. It is written in pure and classical Greek; the characters bear several marks of antiquity; and none of the names occurring in the Chronicle can be accounted for by any of the writers who were taken from writers of a later date are sufficient to establish the fact. Mr. Robertson supposes that it must have been a spurious fabrication of some learned Greek as late as the sixteenth century, executed from a mercuryi motive; but this is contrary to the gain that it might be sold for a high price at Smyrna, a commodious emporium for such rarities, after he had artfully broken the block, and defaced the inscription in several places, in order to give it an air of antiquity. This suggestion is corroborated by the circumstance that the lines could not have been engraved without great trouble and expense; and the events it relates show a greater acquaint- ance on the part of the engraver, or the person under whose direction it was engraved, with the history of the civilization and literature of Greece, than the second parts of Selden and Chandler, but rather such as serve to illustrate the history of the civilization and literature of Greece. Thus we do not find one event in the Peloponnesian war either mentioned or alluded to, but we have an account of the establishment of the principal religious festivals, the introduction of the different kinds of music into those festivals, of the origin of tragedy and comedy, and of the time in which the most eminent poets and philosophers lived. But as a few extracts from the Chronicle will give a good idea of this part of the ten- tatives, so much the more could impact, we subjoin a literal translation of two different parts, the former taken from the beginning, and the latter from the middle of it. The words and letters in brackets are a translation of those Greek words and letters as given by the second parts of Selden and Chandler, but are effaced in the original.

1. I have described preceeding time, beginning from Cercopes, the first who reigned at Athens, to Astyanyax, archon in Paros, and Dioneus at Athens.
2. Since Deucalion reigned at Athens, and the country was called Cercopia, before called Acteia, from Actaeon, a native of Cercopia, 1310 years.
3. Since the cause was tried at Athens between Ares P. C. No. 1070 and Poseidon concerning Halirrhoeus the son of Poseidon, and the place was called Areopagus (Ἀρειπός παγός), 1256 years, C[α]n[o]s re-igning at Athens.
4. Since the delay happened in the time of Deucalion, and Deucalion escaped the rains, [and went] from Lycorea to Athens, to [C]an[o]s, and built the temple of Zeus Olympios and other sacrifices for his preservation, 1265 years, C[α]n[o]s reigning at Athens.
5. Since Amphictyon, the son of Deucalion, reigned in Thermopylae, and the people inhabiting that district, and [called] them Amphictyonites, and [the place of meeting Πιτακοες] which now also the Amphictyonites still sacrifice, 1258 years, Amphictyon reigning at Athens.
6. Since Hellen, son of Heracles, the son of Deinomenes, who before was called Graikos, and [they established] the Panathe- nean games (γαμος), 1257 years, Amphictyon reigning at Athens.
7. Since Xerxes formed a bridge of boats on the Hel- lospont, and dug through Athos, and the battle was fought at Thermopylae, and the sea/night by the Greeks at Salamis against the Persians, in which the Greeks were victorious, 217 years, Calliades being archon at Athens.
8. Since the battle at Plataea was fought by the Athenians against Mardonios, the general of Xerxes, in which the Athenians conquered, and Mardonios died in the battle, and the fire flowed [in Sicily] around Attica [2]16 years, Xantippus being archon at Athens.
9. Since Gelon, the son of Deinomenes, became tyrant (of Syracuse), 215 years, Timoleon[en] being archon at Athens.
10. Since Simonides, the son of Leoprethus, the Cean, who invented the art of memory, got the prize at Athens teaching (a choros), and the statues of Harmodius and Aristogiton were erected, 214 years, [A]damantos being archon at Athens.
11. Since Hero was tyrant of Syracuse, 209 years, Carles being archon at Athens. Epicarmos, the poet, also lived at this time; one of his tragedies is extant.
12. Since Sophocles, the son of Sophilos, who was of Colonus, gained the victory in tragedy, being 28 years of age, 206 years, Aesopheus being archon at Athens.
13. Since the Musicae of the Egos Potami, and Simonides, the poet, died, having lived 90 years, 292 years, Theagenes being archon at Athens.
14. Since Alexander died, and his son Pher[icles] reigned over the Macedonians, 198 years, Euthyphas being archon at Athens.
15. Since Echylus, the poet, having lived 69 years, died [at Gel[a] in [Si-cily, 193 years, Calli[as the First being archon at Athens.

The preceding extracts are sufficient to give a general idea of the nature and contents of the Chronicle. For an exact examination of all the facts, we are referred to the same volume of Hales's 'Analysis of Chronology,' PARIAS. [HINDUSTAN. vol. xii. p. 232.]
PARIS.
PARITIAL BONES. GREEK.
PARIME MOUNTAINS. THE, are an extensive system of mountains in South America, which spread over the surface of English, Dutch, and French Guyana, and also over a great part of the eastern portion of the republic of Venezuela and French Guiana. In length they extend nearly 1200 miles, between 51° and 68° 36' W. long. Their width varies between 140 and 450 miles, between the parallels of 1° and 8° N. lat. According to a rough calculation, this mountain-system covers a surface of 476,000,000 square furlongs. The moun- tains are separated from the shores of the Atlantic by a low and flat country varying in width between 30 and 70 miles. The river Oroincu runs along the western and partly also along the northern base of the mountains.

The term mountain-system can properly be applied to this region. So far as it is known, it is only a huge mass of rocks, which gradually rise higher as they advance southward, until their general level attains an elevation of from 1500 to 2000 feet. The surface of this rising ground extends in many cases to an interval in nearly level plains of some extent, but in others it is greatly diversified by hills, either
isolated or forming ridges several miles long, and by short valleys or depressions. Few of the hills and ridges rise more than some hundred feet, and a very few summits attain more than 1,000 feet above their base. The country along the coast is thickly wooded, as well as the greater part of the country between them, but many of the level tracts are savannahs without trees, or only covered with low bushes, which however display a great luxuriance of vegetation. Such is the nature of this region as far south as 20° N. lat. east of 58° W. long, but only as far south as 4° N. lat. west of 58° W. long.

West of 58° W. long, and near 4° N. lat. a continuous range begins, which runs westward to 64° W. long, nearly under the same parallel, and west of 64° W. long, inclined northward at that and at its junction near 8° W. long, it reaches nearly to 3° N. lat. This range is called Sierra Pacaraima. In its eastern part it rises from 1500 to 2000 feet above its base, and from 3000 to 4000 feet above the sea-level. Further west the range is continued with the Cerro Maragua and Cerro Duca, whose summits attain an elevation of about 10,000 feet. Along the southern base of the Sierra Pacaraima the Rio Parimé runs eastward, and the Rio Tokoto westward, and by their junction near 64° W. long, the Rio Branco, an affluent of the Amazonas, is formed. The two branches of the Rio Branco drain an extensive valley, which is enclosed on the south by another ridge of less elevation.

East of 58° W. long, the highest part of the mountain-range, which we have described on our map as the Cerro Acaráy, seems to lie between 1° and 2° N. lat. But we are entirely unaugmented with its extent and elevation. At its eastern extremity there are several ranges branch off northward, which traverse the French colony of Cayenne, and render its surface more mountainous than the territories of Dutch and British Guiana. [Guyana.]

The Sierra Acaráy is not connected with the Sierra Pacaraima by a ridge. There is a break between them in the mountain-region, which is occupied by the wide valley in which the two branches of the Rupununi runs eastward to the Essequibo, and the Rio Tokoto westward to the Branco. Where the two rivers approach near to one another (near 3° 30' N. lat.), they are separated by a low level tract. This tract contains a lake called Amucu, which in the dry season is small, but wide. The reason inaduates the adjuncts of the lake, which are only discharged into the Tokoto by the Rio Pirarara.

This mountain-region does not contain wide and extensive valleys in which rivers flow over a gently inclined surface, but consists of long ridges, on which the streams have forced their way in a deeply excavated bed between rocky banks of several feet elevation. Accordingly all the rivers of this region are nearly an uninterrupted succession of rapids and cataracts, which render their navigation very difficult, and the tramps in heavy vessels nearly insupportable. It is only in the lower part of their course, where they run through the level country which separates the mountain region from these, that there are no impediments to navigation.

(Humboldt's Personal Narrative; Schomburgk, in London Geographical Journal, VI. and VII.)

PARING AND BURNING. This operation consists in cutting a thin slice from the surface of land which is overgrown with grass, heath, fern, or any other plants without harming the matter, which experience has shown to be a very powerful promoter of vegetation.

The instruments by which this is effected are, either a common plough with a very flat share, which may be used when the surface is very level without being encumbered with stone or large roots, as in most cases a paring-iron used by hand. (See fig.) The crossbar of this instrument is held with both hands; and the upper parts of the thighs, being protected by two small slips of board, push the instrument into the ground, so as to cut it off. The lower part is turned over by moving the cross-handle. The labour is severe, and a good workman can scarcely pare more than one-sixth of an acre in a day. The price of this work is from 15s. to 25s. per acre, according to the price of labour. The drying, burning, and spreading of the ashes is then done by hand, from 10s. to 15s. more: thus the whole cost is from 25s. to 37s. per acre. In France it is done by a sled, which is like a shipwright's adze, and the operation is called fecouer.

Paring and burning the surface is an almost invariable practice in almost all countries where the crops are partially or totally burly, where these lands are in a state of nature, overrun with wild plants which cannot be easily brought to decay by simply burying them in the ground, burning is the readiest and most effectual mode of destroying them. In this case the practice is universally recomended, and strongly reprobated on the other.

When we come to apply to the subject the test of experience, we find that in the case of vegetable matter which are presented to us by the abettors of the practice and its adversaries, we shall find that the advantages and disadvantages are considerably increased by the circumstancs under which the operation is carried on. It may be necessary to make an impartial examination of the subject, to inquire into the changes produced on the substances subjected to the process of burning, when it is done with due precautions.

In burning vegetable matter in an open fire, the whole of the dry earth will also absorb from the atmosphere a considerable portion of the matter, and particularly the salts which the fire could not dissipate. These are no doubt very powerful agents in promoting vegetation, when they are added to any soil: but they are obtained at a very great expense of vegetable matter, which is necessarily destroyed in the earth, might al-o have afforded food for vegetation. If the earth which is burnt with the sods is of a cold clayey nature, the fire will change it into a kind of sand, or black dust, which is insoluble in water, and corrects the too great hardness of clays, by converting them into a silt, which is now the most nutritious of all kinds of soil. This is so well known, that clay is often dug out of the soil to be partially burnt. On stiff clay soils therefore there is a double advantage in paring and burning, that of vegetable ashes and of the burnt clay. When the fire is so managed that the vegetable matter is only partially consumed, the oily and inflammable portions being converted into a vapor by the fire without being destroyed, and absorbed by the earth, the effect produced is only to impregnate the earth with minute particles of matter, readily converted into the constituent parts of vegetable matter. The earth is the most frequent of these particles, which are held in its pores, as water is in a sponge, ready to be lost to any substance which has the power of attracting them. The moisture, which the dry earth will also absorb from the atmosphere if no rain should fall, is retained and increased by the effect of the
salts with which it is impregnated. It is uniformly observed that turnip-seed, which in most soils will not vegetate without heavy dews or rains, if sown in dry weather, scarcely ever fails to do so. It is a soil that has been burned and not burnt. May not this be ascribed to those particles, which have been taken up by the earth in the operation of slow combustion, absorbing moisture from the air, and giving it out to the seed which has been sown? It does this better than a burning soil. A heavy snow falls on the ground for a short time, and swells the seed; but, if it be succeeded by a hot sun, the water evaporates so rapidly, that the seed loses its moisture, and vegetation stops. The earth, which attracts moisture from the air, keeps it, its absorbent nature preventing any loss of water; and further, it gradually to the vegetating seed as it is required. The wonderful effect of peat-ashes on young clover may be explained on the same principle, and probably also that of gypsum. There can be no doubt then, that certain substances may be removed from the surface of peat and burning the surface of clays. But what is lost and destroyed in the operation? All that escapes in the shape of gas or vapour. The gas will probably be carbonic acid; for this is formed in the combustion of charcoal. We know that hot lime has a very strong attraction for this substance, which fixes it in a solid state, becoming a carbonate of lime: and we have no reason to think that it parts with it to the roots of plants. But other earths may absorb carbonic acid, with or without the formation of a great proportion of it in the water, with which it is known to combine in certain proportions, and to be thus carried into the vessels of growing plants by the attraction of the roots. If this should prove to be the case, we may account for the great effect of burnt sods in burning vegetation.

The principal objection to burning is, that it destroys a great portion of vegetable matter. But this is a fact to be proved, and is perhaps rashly taken for granted. When vegetable matter decays in the earth, it loses much of its substructure, and when burnt, the volatiles and loose matter are carried off into the atmosphere. It is possible that thus more is lost during the time that the slow decay goes on, than even in burning with due precautions. This is a fact which it may be difficult to ascertain; but it is impossible; and therefore the principal growing matter of the burnt soil appears on some proof or experiment. The earthy portion of the soil may be diminished, by driving out the water which it held, as is manifest in burning clay, and it shrinks into a smaller space; but there is as much earthy substance as before, though the soil be burnt. One point of view of the burnt seems to be as follows: when a burnt soil appears then, that a clay soil may be burnt and without its real substance being diminished; and if its texture is improved, it becomes more fertile by the operation. Burning clay soils is in fact something analogous to liming it, which has its analogy in the decomposition of animal and vegetable matter in it. Paring and burning therefore should be joined to manuring, if a powerful and immediate effect is desired without exhausting the soil; and in this case we do not hesitate to recommend it on all soils where rank weeds are apt to spring up, and coarse grasses take the place of the better sorts which have been sown. The proper time to prepare is evidently after the land has lain in grass for several years, and is broken up for tillage. The surface should be level, and the furrows or temporary banks filled with sods should be as thick as possible for the sod, and as much made as possible for a better soil. It should do with a breast-plough or paring-iron by manual labour. The sods should be moderately dried, and then arranged in a heap, and the sods are burnt once in every ten or twelve years, provided it were judiciously treated in the intervals. The farmer would be benefited in many situations, and the practice would tend to keep up the value of the farms.

In Devonshire, where the land has been pared and burnt from time immemorial, even where the soil is rich, the practice has been often resorted to without any judgment. In some part of the land where the cost, the consequences to the future state of the land were not heeded; and landlords, seeing their farms impoverished, put a stop to the practice. Thus many useful modes of cultivation have been reprobated from the abuse of them, which properly applied, would have been advantageous to parties...
There is no maxim more true than this: that whatever injures the landlord, injures the farmer who is not desirous of removing, and *vicere terrae*; and all positive restrictions on cultivation, however necessary when there is a fear of dis- honest conduct, diminish the value of a farm and lessen the rent which can be fairly afforded for it. Ignorance is often a greater destroyer of the interest of both landlord and tenant than wilful dishonesty; and the spreading of useful information among the peasants, so that they may see the advantage, is the surest means of improving landed property. Many tracts of waste land might be brought into cultivation by means of paring and burning, without which it would never repay the labour required. Where the soil is indubitable, the operation is greatly improved by the indispensable preliminaries of cultivation. The ashes and the lime will produce vegetation and food for animals. These will produce dung to supply what the vegetation abstracts, and to assist also in the further decomposition of the peaty matter, converting it into vegetable mould.

The first crop after paring and burning, as was observed before, should, if possible, be turnips, and these should be consumed on the spot; but there are exceptions to the rule. The soil may be a stiff clay of a considerable degree of nature, as is the case in many of the uncultivated grasses. In this case the surface is burnt to destroy these, and a crop of corn may safely be taken after the paring and burning, the land coming into a regular alternate rotation after a few years. If the most corn crops are taken with a good proportion of dung; or clover may be sown with the first crop, if the ground appears fit for it. The effect of the ashes will be readily perceived in the luxuriance of the clover. Sunn and may be afterwards cultivated, according to the nature of the land, with the corn or the new farm, and down to grass after a course of cleansing and ameliorating crops. Thus old wet meadows, after having been well underdrained, may be greatly improved, and either converted into arable fields or laid down again with choice grasses. Old rag pastures may often be very much improved by a very thin paring and burning, so as not to destroy all the roots of the grass. When the ashes are spread over the parred surface, some good grass-seeds are sown with them. The whole is well harrowed or scarified and rolled, and the grass shoots empty, or turned earth. The dung in a compost, is a most excellent practice, and often superior to that of using the sods only, without burning them. These sods contain innumerable seeds of weeds, and eggs or maggots of insects, which are not destroyed by the burning of the crop, but come up again to life. The loss of a portion of vegetable matter in the burning is amply compensated by the destruction of these enemies of the future crops.

It is not to take notice of the soils and situations where paring and burning cannot be recommended. Wherever the soil is very loose from a great proportion of silicious sand in its composition, and is held together chiefly by the slender roots which run through it, the burning would destroy the whole of the vegetable matter; for none of the volatile parts which the fire dissipates or generates would be retained or absorbed, but would pass through the loose sand in the same way that water would. Here then would be actual destruction; and the residue would be a mere barren silicious sand, which would soon be blown or washed away when held together by the roots. The only way to bring such soils into cultivation is to put clay or marl on them, and to force vegetation by means of liquid manures, chiefly the urine of animals, consolidating them by very moderate manures. It is obvious that this is the case when the manure may not be washed through by the rains. Such soils may be improved, but they are the most ungrateful of any; and it is only necessary and indefatigable industry which will make them produce any crops.

It is very easy to ascertain whether any soil will be improved, or not, by paring and burning. A few soils may be taken and exposed to heat in an iron pot closely covered over, or in a large crucible: the heat should not be so great as to produce igne, but should be kept up for a considerable time, till the soils are consumed. If the ashes are red, and the whole is in a flue powder, with particles of charcoal in it the soil from which it was taken may be safely pared and burnt, especially if it forms a mud with water, and the earth is not readily deposited. But if it feels gritty, like the water readily through, and is soon deposited where met with, burning will not be advantageous. This is the evident result of the principles laid down before.

On the whole, the operation of paring and burning, when judiciously applied and properly performed, is a most excellent of all improvements. It does not diminish or decrease either the fertility, or the year that is no more than a natural manure and manured, and a judicious succession of crops is adopted; but on the contrary it will improve their quality and texture, and make them more productive.

The Sabino, Colonna, and others of the best and most popular Italian poets of the eighteenth century, was born in the district of Bosio near the lake of Pianseo, in the Milanese territory, May 22, 1729. His father, though poor, was anxious to bestow upon him a good education, and for this purpose was obliged to seek to support himself at an early age, by copying, and it was only in the intervals of his employment that he could study the best writers, both Latin and Italian. In compliance with the wishes of his friends, he published a number of sonnets, and in 1765 was admitted to the Accademia dei Transfor- mati at Milan, and that of the Arcadian at Rome. These distinctions obtained him other patrons, and he was suc- cessively employed by the college of La Scala, and by several noblemen and noble families, which office he accepted chiefly in order that he might be able to support his mother, who was now become infirm. It was in 1763 that he published the *Matino*, the first part of his celebrated poem *Il Giorno*, which he had been induced to do by Count Formana, then the minister of Lombardy, who, after employing him some time in editing a gazette, appointed him professor of belles-lettres in the Palatine schools (scuole palatine) at Milan, and, on the supposition of the Jesuits, promoted him to the professorship of rhetoric at the college of the Bresca. His course of lectures, which were printed, was as favourably received as were those which he afterwards gave on the fine arts; and both of them contributed materially to disseminate an improved taste. After the death of his patron Count Formana, he found himself twice in want, because he had been influenced in his expectations of being able to serve his fellow-citizens, he requested permission to retire from office, and bestowed on the poor the emoluments he had derived from it. From this period he lived in retirement, poor but happy. His health, however, was not so good, and but for the benevolence of the nobility, he would have been reduced to destitution. In addition his general health, he was obliged in his seventeenth year to undergo an operation. He died August 13, 1799, and the satirist of Rome, his friend, published the memoir of him in the *Ateneo di Roma*, no. 17, January 12, 1800. (R.)
town of the Parisii, a tribe probably of the Belgic stock. In that part of the Seine which now traverses Paris were antiently five small islands, on one of which, now the island of La Cité, Lutetia stood. This island was then of smaller dimensions than at present, and the smaller islands at its extremity having been incorporated with it. Lutetia, antecedent to the Roman conquest, was an unwalled place. The etymology of the name of the Parisii has been much disputed. Dulaeus conjectures that it meant 'inhabitants of the island.' A Bonnemaison, in the neighbourhood of the town of Hull in Yorkshire, had the same designation.

In B.C. 54, Caesar convoked at Lutetia an assembly of the nations of Gaul. (Cæs. De Bell. Gallic., lib. vi. 3.) In the general assembly, the insular Gauls of the island of Jersey was burnt by the Gauls to prevent its falling into the hands of the Romans; but it subsequently came with the rest of Gaul into their power, and in the division of the country made by them was included in the province of Gallia Transpadana.

For the next four centuries the place is hardly noticed, except by the geographers, by whom the name is variously written: nor does it appear to have been of any importance until the later period of the Roman dominion. About A.D. 318, or 369, it took the name of the Parisii, comprehended which it belonged to the Parisii. It was the seat of a bishopric, perhaps as early as the middle of the third century. Lutetia was the favourite residence of Julian while he governed the provinces of Gaul with the rank of Caesar. In or about the year 494 it was taken by the Franks and was destroyed. In the great Roman buildings connected with the town extended beyond the island to both banks of the river.

Several traces of Roman possession have been discovered at Paris, and some still remain. In the ile de la Cité, however, all the fragments were either destroyed, or were burnt on the order of Jupiter was dug up, or rather a number of stones bearing sculptures in relief and inscriptions. These inscriptions, which belong to the reign of Tiberius Caesar, indicate that at Lutetia the gods of the Romans and those of the Gauls were united in one temple. In the Gallo-Roman law courts of the Palais de Justice (courts of law), a sculptured stone more than six feet high, with figures in relief on its four sides, was discovered. On the north side of the Seine the remains of a subterranean aqueduct have been discovered in forming the place or square of Louis XVI. (A.D. 1763); and a basin, presumed to be connected with this aqueduct, was discovered in the garden of the Palais Royal. Remains of tombs and other sepulchral antiquities have been discovered in the Rue Vivienne and on the north side of La Cité. Other antiquities were found at La Villette in digging the basin of the canal of the Ourcq, and at Montmartre. On the south side of the Seine there are some remains, opposite the isle of la Cité, which were discovered in another apartment opening into it, or rather forming a recess in it: the masonry of these consists of alternate courses of stone and brick, covered in some parts with stucco. Some remains of a subterranean aqueduct have been traced in different parts of Paris, as far south as the village of Arcueil, five miles south of Paris, to Paris, and many antiquities were dug up in the gardens of the Luxembourg. The lower part of the tower of the church of St. Germain-des-Pres is supposed to be a remain of the original church built on that site by the Romans, and first dedicated to Sainte-Croix and St. Vincent.

Clovis, some years after the capture of Paris, fixed his residence there (A.D. 508), and was buried there (A.D. 511). It gave name to one of the kingdoms into which the dominions of the Franks were divided, and comprehended in the kingdom or district of Neustria. After A.D. 567 it ceased to be the residence of the kings of the Franks. Several of the churches and other religious establishments of Paris were founded in the reigns of the Merovingian kings.

In 845 the Northmen or Normans pillaged the city, which the inhabitants had deserted: in 856-7 they pillaged it a second time, and burnt some churches: in 861 they pillaged it a third time, and burnt some more churches. At this time William the Conqueror (Grand Pont) afterwards, over the wider arm of the Seine on the north side of La Cité, to enable their banks to ascend higher up the river. After their retreat, the bridge was repaired by Charles le Chauve. In 863 the Normans again attacked the place. The fortified part of Paris was still limited to the island of la Cité, which was walled. The assailants, to the number of 33,000, made several unsuccessful attacks, and at length retired on the conclusion of a treaty with the emperor Charles le Gros (A.D. 896). In A.D. 976 the emperor Otho the Otho II., at the head of 70,000 men, advanced to Paris, burnt a suburb, but was soon after attacked and put to flight by Lothaire, king of France. Under the Carolingians, Paris was the capital of a county comprehended in the duchy of France. Hugues Capet inherited both the titles and the possessions of the counts of Paris (A.D. 987), they became part of the royal domains.

Hugues Capet, now king, continued to reside at Paris, which thus again became the capital of the Franks, or, as it may now be called, of the French kingdom. In the reign of Louis VI. (A.D. 1108-1137), the fortresses of La Grand Châtelet and Le Petit Châtelet on the north and south banks of the river, at the extremities of the two bridges from La Cité to the mainland, were built: they were demolished in the reign of Louis XIV. (A.D. 1662-1715), and the present Châtelet has been raised in their place. In 1662. By the same king of his successor Louis VII. the suburbs on the north and south banks were enclosed by walls, and thus incorporated with the insular part of the city. Under Philippe II. Augustus, a new wall was built to protect it from the frequent ravages of former times, both on the north and south bank, and some of the principal streets were paved; but as late as the time of Louis XIII. (A.D. 1610-1643) half the streets of Paris were still destitute of pavement. Two national colleges were founded, a college of France, which was built, two aqueducts formed to convey water to the northern part of Paris, and several fountains were erected. The enclosure by the wall of Philippe Augustus was in several parts unoccupied or was devoted to culture; but the city was extended by the building of streets, and colleges founded by Louis IX. (St. Louis), his grandson; and entirely by the buildings erected by succeeding princes; so that in the reign of Jean II. (A.D. 1350-1364), the town had outgrown its limits, and many edifices had been built without the walls. In 1377 the river was crossed from the English after the battle of Poitiers (A.D. 1356), new walls were raised on the north side of the Seine, comprehending a yet larger enclosure than those of Philippe Augustus; and on the south side the old walls were repaired and the ditches deepened. The island of Notre Dame (now of St. Louis), immediately above that of la Cité, was also fortified by a ditch dug across it.

Le procédé des marchands (the provost of the traders) was introduced at this time a general privilege. This privilege, which passed from one generation to another, and which, sometimes termed La Houte Parisienne, gradually came to occupy the place of a municipal body.

The treaty of Troyes (A.D. 1420) and the events connected with it gave Paris into the power of the English party, and the city remained under the government of Edward, the king of England and claimant of the throne of France; or rather, under the government of the regent duke of Bedford, from A.D. 1421 to 1436. In 1429 it was attacked by the troops of Charles VII. of France under the command of Jeanne d’Arc, but the assailants were repulsed. In 1436 it was taken by the French under the count of Richemont, constable of France, and the count Dunois, with the aid of the townsmen. The English garrison was surprised and put to the sword, except a few who retired to the fortress of the Tuileries. The town was plundered and despoiled.

During the troubled period of the dynasty of Valois, the edifices, public and private, of the city were gradually improving in character. The population of Paris in the latter half of the fifteenth century assembled by the English and Rallure to have been about 150,000. The privilege of the place being exercised; and it is a manifestation of the general insecurity, that the environs and suburbs, and occasionally Paris itself, were infested with wolves, which destroyed a considerable number of the inhabitants. The state of morals was extremely bad, and the clergy and monks a great source of the general corruption.

In the reign of François I. the fortifications of Paris were repaired and strengthened. In the reign of Charles IX., A.D. 1566, the circuit of the walls was materially enlarged, in order to comprehend the palace of the Tuileries, then in
course of erection, by Catherine de Médici, the queen-mother. The edifice of the king was at that time at the Louvre, originally a fortress of ancient date, which had been made a royal residence, and enlarged and adorned by the care of successive sovereigns. It was at this time being gradually rebuilt. The rebuilding of the suburb of St. Germain, on the north side of the Seine, at that time almost ruined in the wars of the fifteenth century, was commenced and some of its streets paved in the time of François I.; and in the reign of Henri III. a bridge was erected (near where the Pont Royal now stands) to connect the quarter of the Louvre with this suburb. This appears to have been the only bridge across the undivided stream of the Seine. There were five other bridges which connected the island of La Cité with the main. Two of these, long known as Le Grand Pont (on the site of the present Pont au Change) and Le Petit Pont, had existed (or rather had been) in the time of the Romans. The Pont des Moulins (mills' bridge), connected La Cité with the north bank of the river a little below the Pont au Change.

The other two bridges were the Pont Notre Dame and the Pont Neuf. The latter was first mention in 1206, a bridge which united La Cité with the north bank, was built A.D. 1413, in the place of a former private bridge communicating with some mills on the river, and rebuilt of stone (A.D. 1500-1512); it is at present the oldest bridge in Paris. Pont St. Michel, the next bridge from the Louvre, had existed (A.D. 1378-1387), damaged and repaired repeatedly, and was entirely rebuilt in the seventeenth century. In the reign of Henri II., successor of François I. (A.D. 1549), the erection of the present Hôtel de Ville was commenced, but it was more than fifty years before it was completed, in 1570.

The police of the city continued to be in a wretchedly inefficient state. The number of robbers and others engaged in lawless pursuits was estimated by a contemporary authority at 6000 to 7000; the paupers were estimated by another authority at 8000 to 9000; both of which numbers are evident exaggerations. The whole population, in the time of Henri III., is estimated to have been 200,000 or upwards.

In the religious troubles of the sixteenth century, Paris was several times the scene of generaloral, great revolts, such as the Massacre of St. Bartholomew, Massacre of St. Bartholomew. In 1586 the Parisians, who had embraced the party of the League, barricaded the streets with chains, with the paving-stones torn up for the occasion, and with casks of earth; and metal bars, with many of the institutions which Henri III. had brought into the city. This revolt is known in history as the day of the barricades.

The assassination of the Guises at Blois (December, 1586), the Parisians broke out into a fresh revolt: the duke of Aumale was chosen governor, and the direction of affairs was assumed by a committee of the League, designated the Council of Sixteen. Henri III., who had effected a reconciliation of the interests of the League and the king, as a neutral, not party, advanced to besiege Paris, which was now under the command of the duke of Mayenne, brother of the murdered Guises: but the assassination of Henri III. at St Cloud (August 29, 1589) arrested his purpose. The siege was formed on the 31st of the following October, by his successor Henri of Navarre, now Henri IV. The suburb of St. Germain was plundered, but the siege was raised soon afterwards, and the king retired with his army. In the following winter the siege was raised, all taken in one night, and the gates were strictly blockaded. The effect of this measure on a population so vast was truly dreadful. The most loathsome articles were consumed for fuel; numbers perished, and parts of the city were almost reduced to ashes. The population, moved, all 3000 of the poorer class to pass out of the place, and regularly admitted supplies of provisions to enter. The approach of a Spanish force under the duke of Parma obliged him to raise the siege (August 30); and he did not obtain possession of the city for some months, moved, at the request of the governor (the duke of Brissac) and other influential persons.

In the reign of Henri IV. Paris received many improvements. The Pont Neuf, which had been commenced in the reign of Henri II., was completed, and two most of the islands in the Seine were united to that of La Cité. All the bridges, except the Pont Neuf, were at this time lined with houses. In respect of cleanliness and security from robbery, little improvement seems to have taken place. In the reign of Louis XII., an immense number of religious establishments were founded at Paris. The palace of the Luxembourg was built by Marza de Médici; the Jardin des Plantes was laid out chiefly by the desire and under the direction of Labrouste, one of the members of the Cabinet, of which the Duke of Roanne was President, and the Académie founded by Cardinal Richelieu. New walls were erected on the north-west side of the city, enclosing a considerable space north of the Tuileries and extending the circuit of the enclosure nearly to the line of the present boulevards. The then built notre Dame, the St. Louis, was entirely covered with houses and joined to the main by two bridges. The Pont au Change was rebuilt, and a wooden bridge thrown over the river where the Pont Royal now stands. The police of the city underwent little change. Orders of every kind were frequent, and in 1621 the mob made an attack on the Huguenots who were returning from worship at Charton, mutilated the minister, and murdered several of the hearers. [Charton.]

The minority of Louis XIV. was a troubled period, and the first scene of action under the new regime was the massacre of St. Bartholomew. In 1632, the mob, in the suburb of St. Antoine by the royal army attacking the suburbs, and the badge of Paris, was easily taken, and the city was put into hands of the Mazair, who were known by the designation of Frondiers (allegers) or collectively as the Fronde, were supported by the Parisians. On occasion of the imprisonment of Broussel, one of the members of the parliament of Paris (A.D. 1634), the people of Paris refused to obey the order of the King, and in the French and Swiss guards, and ultimately obtained the release of Broussel. Next year new troubles broke out; the Frondiers, in arms, occupied Paris itself; the king's troops, under the prince of Condé, occupied St. Denis, St. Cloud, and Chartres. The negotiation was, however, brought to an end, and peace was soon made. In 1652 the peace of Condé, who had joined the party opposed to Mazarin and the court, was with his army attacked in the suburb of St. Antoine by the royal army under Turenne. The city was not surrendered but was blockaded and relieved by the Parlement. In the long reign of Louis XIV. (1643-1715) Paris was greatly extended and improved. A great number of religious and charitable establishments were founded, and new churches and chapels built. Among the more remarkable of the charitable institutions of municipal workhouse called L'Hôpital Général or La Salpêtrière (established A.D. 1656), and its dependency, the Bistre [Biscuits], and the hospital or asylum for old soldiers, known as the Hôpital des Invalides. Louis made considerable alterations in the buildings of the city. The old suburbs were demolished, and the narrow streets were widened. The boulevards in that part of Paris was formed; new streets were laid out, and quarters made along the banks of the river; the police of the city experienced several improvements; the streets were lighted, though in a miserable refection; the churches were restored, and the charity accruing to what attended to. The population of Paris, at the close of the reign of Louis XIV., was fast approaching half a million.

The long reign of Louis XV. (A.D. 1715-1774) and the earlier part of that of Louis XVI. (A.D. 1774-1792) furnished few local incidents. The distress caused by the financial projects of Law (A.D. 1720) occasioned some tumults. The years 1727-31 were marked by the extraordinary expenses of the great war. In 1792 the king was first quartered at the tomb of Paris, a Jansenist clergyman. [Jansenist. In 1727 the Bakers' shops were plundered by a mob excited by the dearth of corn.

From the commencement of the reign of Louis XIV. to the period of the revolution of 1789, there were considerable accessions both to its extent and the number of buildings. Ecclesiastical establishments continued to increase; the church of St. Cléone (the Pantheon of the
 revolutionary period), the Hôtel des Monnoyes (or Mint), and the Ecole Militaire (Military School) were built; market places and houses in considerable number were formed; fountains and theatres erected; a line of boulevards formed on the south side of the river; the Petit Pont, which united the Cité with the south bank of the river, rebuilt; the Place Louis XV. laid out; and the erection of the Pont Louis XVI. commenced. Paris was also surrounded by a wall, which Russian armies, and Wellington and Napoleon's gendarmerie enclosure, and designed to prevent the introduction of commodities without the payment of the octrois, or local taxes.

The local history of Paris during the Revolution is in fact the history of the Revolution itself, of which it was the principal scene. In 1789 (July 14) the Bastille was taken and demolished by the Parisians. In October of the same year the king was brought from Versailles to Paris by the Russian mob, who had gone to Versailles. On the approval of the king and his government, the Revolution was completed.

The guillotine was erected in the Place or Square of Louis XV., between the gardens of the Tuileries and the Champs Elysées, and the king himself was one of the earliest victims, 1st January, 1793. In June the Girondists in Convent Place was overthrown, and the faction of the Mountain became supreme. The clubs, especially that of the Jacobins, the commune of Paris, a self-elected municipal body, and the committees of the Convention, were the ascendant parties. In July and August there were too similar times of expiration was shown. The reign of terror' now commenced; executions took place daily in the Place Louis XV.: Charlotte Corday, the assassin of Marat, the queen Marie Antoinette, Brissot, Vergniaud, and others, the most illustrious members of the Girondists and the judicial revolutionists. In the months of August, Saint-Just, Danton and Camille Desmoulins, Mountainists themselves, Madame Elizabeth, sister of Louis XVI., and numerous others perished. The victims at one time amounted to fifty or sixty a day, and occasionally exceeded that number. The period of the yearly execution of an army of 20,000 and 25,000, and even 29,000 for hours after the executions went wet with blood. The guillotine was shifted from the Place Louis XV. to the Place de la Bastille, and from thence to the Place du Trône, at the eastern extremity of the city, from whence it was brought back into its present place attached to the Rue de la Roquette by Brissot and his associates (28th July, 1794), which put an end to the reign of terror. The Convention, freed from the tyranny which Robespierre had established, restricted the power of the terrible committees, abolished the commune of Paris, and gave the direction of the affairs of the city to the executive of the National School, the Institute, and the Bureau des Longitudes own establishment to the Convention. In 1795 the Parisian rabble rose repeatedly against the government, but were put down by the armed forces of the forty-eight sections, or wards, into which Paris had been divided. In October, 1795, this armed force itself rose against the Convention, but was completely defeated by the troops of the line at Paris, commanded nominally by Barras, but really by Bonaparte. The troops included within the walls of the city, numbering 30,000 men, were divided into the hands of the two legislative councils and the executive directory. In February, 1796, a new municipal government was given to Paris, or rather twelve governments, one to each of twelve districts into which it had been divided. The last of these (l'Antiquité) was founded by a stroke of the sword by Bonaparte, with the aid of the military officers and of a party both in the executive directory and the two legislative bodies. Bonaparte, successively first consul and emperor, became the virtual head of the nation, and under his vigorous and able government Paris enjoyed almost uninterrupted quiet till the year 1814. Under the government of Bonaparte, Paris was greatly improved.

Paris was taken 30th of March, 1814, by the allied forces under the command of Prince Schwarzenberg, who was succeeded by Massena, and the troops entered, amidst every mark of welcome by the people. Napoleon was dethroned and the Bourbons restored. Next year Napoleon returned (20th March), and was received by the military at Paris with general joy, but the defeat of Waterloo brought the allied English and Prussian armies under Wellington and Blücher into the city. The troops in garrison amounted to 40,000 or 50,000, besides national guards and volunteers, who entered into a convention (3rd July) to quit Paris and retire behind the Loire. On the 8th of July, Louis XVIII. re-entered Paris, and was acclaimed. The Bourbons were restored, and the interval of tranquillity followed, but in November, 1827, on the election of liberal deputies at Paris, considerable riots took place; barricades were formed, which were taken and overturned by the gendarmes and troops of the line. In 1830 the riots were renewed, and the celebration of the third anniversary of the restoration of Louis, which overthrew the Bourbon dynasty, and established that of Orleans. In this memorable struggle above four thousand barricades were formed, and the relaying of the pavement torn up for this purpose cost 250,000 francs. Of the Parisians 9000 were wounded, and 4500 wounded. The troops and gendarmes appear to have lost about 75 killed and 300 wounded. They were commanded by Marshal Marmont, duke of Ragusa.

In October, 1830, a mob arose to demand the death of the ex-ministers (Poinçot, Vandon, etc.), and to put Louis Philippe on the throne, but it was put down without difficulty. In December, fresh troubles were excited by the sentence on the ex-ministers not being capital, but these also were easily repressed. In 1832, on occasion of the funeral of General Lamarque (6th June), the report of the threats of the bulging citizens did not sympathise with the rioters. Since that period Paris has been several times troubled by commotions, though of small importance, and by repeated attempts to assassinate the king.
the outside of the wall, such as Passy (pop. 4565), on the east; Montmartre (pop. 4538) and La Villette (pop. 4599), on the north; Belleville (pop. 4179), Monmartre, and Charenton, on the east; Montrouge (pop. 3847), on the south; Vaugirard (pop. 6695) and Grenelle (pop. 1647), on the south-west. The population of these villages is from the census of 1831.

Two of these passes through Paris in its course from the south-east to the west side of the enclosure, dividing the city into two unequal parts, that on the north side of the river being by far the larger. In the river are three islands; there were originally five, but the two westernmost have been entirely removed. The first, adjacent to the island of La Cité, is that of Notre Dame, now St. Louis, are occupied by buildings; the remaining and easternmost island, that of Louvier, is occupied as a dépôt for fire-wood. The banks of the river and of the islands of La Cité and St. Louis are in some cases nearly invisible owing to the complete encroachment of buildings and parks.

The Pont Neuf, which crosses the two arms of the Seine with the intermediate portion of the isle of La Cité, scarcely exceeds the new London bridge or the Southwark bridge in length, and falls considerably short of Waterloo or Westminster. The other bridges are scarcely half the length of the Pont Neuf.

The central part of the town, which is by far the oldest, has narrow and crooked streets, skirted with tall gloomy-looking houses, chiefly built of stone. The outer parts of the town are much more regularly laid out. The greater part of the streets have no foot-pavement; and instead of a kennel on each side, with a raised causeway between them, as in London, there is only one kennel, in the middle of the street. In lighting, as well as in cleanliness, the streets of Paris are far superior to those of London. The streets of Paris, however, have been made of late years; many passages have been opened, paved with flag-stones, for pedestrians only; some of the modern streets are provided with 'trottoirs,' or foot-pavements, and 'trottoirs' have been gradually extended to those of the older streets which are wide enough to admit of them. Some streets are lighted with gas; but the common mode of lighting is by lamps, supported on ropes swung across the street, between the opposite houses.

Passage through the Boulevards (as the boulevards intérieurs) are a line of streets, forming a circuit of smaller extent than the city wall. They indicate, on the north of the river, the line of the ramparts and ditches demolished and filled up by Louis XIV.; on the south side they indicate the former line of the ramparts, and take the ancient walls. They are planted throughout with alleys of trees, and the northern boulevards are the gayest thoroughfares in Paris.

The largest of the places or squares is that of Louis XV., or La Concorde; the other principal places are the Place Vendôme, the Place des Victoires and the Place du Trône (both circular), the Place du Carrousel, and the Place Royale. These places are not commonly occupied by gardens, like the squares of London; but some of them are adorned with statuary, and others with gardens. There are several public gardens and walks, as the gardens of the Tuileries, the Luxembourg, and the Palais Royal; the Jardin des Tuileries (Elisian Fields), the Avenue de Neufchâtel, the famous avenue of the Ecole Militaire, which are streets or roads lined with alleys of trees, like the boulevards. The Champ de Mars is a very large enclosure, attached to the Ecole Militaire, and used for reviews; the Esplanade des Invalides is a garden or pleasure ground originating from the Hôtel des Invalides to the bank of the river.

Architecture.—Philippe Auguste during his long reign (1180-1223) did much for improving and fortifying Paris; he enlarged the old citadel of the Louvre, first founded by Charles the Simple, in the middle of the eleventh century. This was rebuilt by Louis le Gros about 1110. Yet excepting Notre Dame (commenced in the early part of the eleventh century, and whose portal or west front is supposed to have been completed in the time of Philippe Auguste, although other portions are of later date), and one or two other ecclesiastic structures, there is little even in the older parts of the city of earlier date than the reign of Francis I. (1515-1547).

Of Paris at the close of the fifteenth century the architectural physiognomy is graphically sketched by Victor Hugo, "la jolie ville de Paris! une mer de pierre incrustée de tuiles called 'Paris à vol d'oiseau.' Francis I. caused the ancient Louvre to be demolished and a new palace begun from the designs of Pierre Lescot, of whose work there is now remaining that portion of the interior court which has been named the Old Palace, or Old Louvre. The most extraordinary features are the groups of large circular colonnades, project fifteen feet, without any support below. The colonnade is supported by a line of graceful columns, with an entablature above. The soubassement is supported by a line of graceful columns, with an entablature above. The soubassement is supported by a line of graceful columns, with an entablature above.

The Revolution caused the destruction of the ancient baptistery and a number of churches and convents, some of which have since been converted to secular uses. Policy as well as ambition prompted Napoleon to endeavour to efface all traces of the revolutionary period; and most certainly Paris is now more regularly laid out. The greater part of the streets have no foot-pavement; and instead of a kennel on each side, with a raised causeway between them, as in London, there is only one kennel, in the middle of the street. In lighting, as well as in cleanliness, the streets of Paris are far superior to those of London. The streets of Paris, however, have been made of late years; many passages have been opened, paved with flag-stones, for pedestrians only; some of the modern streets are provided with 'trottoirs,' or foot-pavements, and 'trottoirs' have been gradually extended to those of the older streets which are wide enough to admit of them. Some streets are lighted with gas; but the common mode of lighting is by lamps, supported on ropes swung across the street, between the opposite houses.

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in their ensemble, but they also betray great want of study in regard to finish and detail. One of the most striking of them, the Barrière St. Martin (now converted into a barnack or guard-house) is a square of about 90 feet, with an octagonal portico of stone, colonnaded on each of its four fronts; and above this rises a large circular mass 75 feet in diameter, surrounded below by an open arcade of twenty arches (resting upon coupled columns), and as many mezzanine windows over them. Pleasing as this architectural monument, however, as much in proportion as its variety, it will not bear critical examination. This and one or two other barrières are given in Le Grand and Landon's ‘Description de Paris et de ses Edifices,’ which, though it has some defects, is an interesting and convenient architectural manual.

The churches of Paris have undergone distinct times, and of various architects having been employed upon them, the history of some of the buildings of Paris is rendered very perplexed; nor is such difficulty lessened by the repeated changes of names; for instance, what is now the Pont des Invalides was at first called the Pont de Jena, &c. In some cases too political changes have led to more than the mere alteration of names. The costly monumental chapel erected in honour of the Due de Berri was turned into a tobacco-house, and its statue was actually completed, instead of being converted to some other purpose.

Travellers and tourists have generally despethched the architecture of Paris very summarily in a few random remarks on the arrangement of its buildings; the story of the building of the capital are almost unknown to the generality of those who visit it, although they are well worthy of being explored by the artist and antiquary; for if there be a great amount of spirit and originality, there is also abundance of the picturesque, together wrought into a whole.

In the latter respect indeed Paris offers many singular contrasts, such as the Église de la Visitation, or the Val de Grace, and the Chapelle Expiatoire; the Tuileries, and the portico of the Conservatoire, its admirable statues of the Madeleine; in short, extravagant licentiousness of taste, amounting almost to barbarism in some buildings, and severity amounting to pedantic affectation in others. Their adoration of the classical however, has not induced modern Frenchmen to abandon the one or the other. The interior is in plan a true château or a true château; the entablature porico in the court of the Hôtel de la Charité, executed by Antoine about the middle of the last century, is almost the only example of Grecian Doric. It is therefore the Roman style—for the Corinthian can hardly be said to have entered the capital—which predominates in the structures of Paris. We see it in the Pantheon, the Bourse, and the Madeleine; and if columns alone be allowed to constitute architecture, the second of those buildings may rank with the most magnificent of the ancient world. But even the most perfect, even if with the exception of the columns, it is not even Roman or antique at all in character, but a formal affectation, wherein, instead of being skilfully blended together so as to produce consistency of style, very opposite elements are joined. To an English eye however it does not appear the most pleasing specimen of that style; the western front indeed is even disagreeably lumpish and heavy in its general form, probably in consequence of the design not having been completely determined. It may perhaps be only intended to crown the two towers by spires. There are many other parts too which have evidently never been finished, the consequence of which is, that there is a disagreeable contrast between the elaboration of some and the bareness of the rest. For a detailed description of the whole edifice we must refer to that given by Mr. T. Moule, in Winkle's ‘Continental Cathedrals,' limiting ourselves here to a few particulars of its plan and dimensions. The extreme breadth of the nave is 140 feet; the height of the nave 120 feet; the height of the spire 248 feet. The building is cruciform, the height of the transept 122 feet; of the nave 130 feet. There are also in all fifty-two columns; therefore the octostyle, ornate, there are eight at each end, and twenty along each side, those at the angles being reckoned again. The door entrance is on the south or outside of the transept, on the west being 295 feet, that of the transept 262, and the breadth uniform, namely, 104. Instead of pier-arches, the aisles are formed by insulated Corinthian columns 40 feet high, thereby producing an air of great richness and lightness. The doors are, the designs of Bérard; but, by the act of 1802, section of it, for we refer for an account of it to Dôme, pages 68 and 70, where will also be found a notice of that of the Invalides. The total length of the Pantheon, including the porico, is 442 feet.

The new church of the Madeleine, if in some respects superior to the first-mentioned edifice, in others falls short of it, and having no dome, it does not, like that, form a conspicuous object from a distance. externally, it is merely a square edifice, nothing except the height from the ground to the spex of the pediment 116 feet. There are in all fifty-two columns; therefore the octostyle are, there are eight at each end, and twenty along each side, those at the angles being reckoned again. The door entrance is on the south or outside of the transept, on the west being 295 feet, that of the transept 262, and the breadth uniform, namely, 104. Instead of pier-arches, the aisles are formed by insolated Corinthian columns 40 feet high, thereby producing an air of great richness and lightness. The doors are, the designs of Bérard; but, by the act of 1802, section of it, for we refer for an account of it to Dôme, pages 68 and 70, where will also be found a notice of that of the Invalides. The total length of the Pantheon, including the porico, is 442 feet.

The interior is frequently estimated by English travellers as being much less than that of Westminster Abbey, which is probably because they judge chiefly from the effect of the naves in the respective buildings. In the richness of plan produced by the additional aisles and seen connected with them, the interior of Notre Dame must be allowed to surpass the Abbey, but the latter is superior in point of style, while Henry VII.'s chapel has no parallel in the French capital. During the Revolution, Notre Dame suffered considerably; which state of things was ameliorated under the direction of M. Godde, the architect now employed on the Hôtel de Ville.

If our Westminster Abbey has a rival in Notre Dame, the same cannot be said of our St. Paul's, since St. George's, or the Tower, is for very many years, although a work of great merit; of infinitely more, in fact, than a modern French writer (Victor Hugo) has allowed. Very different is the opinion of an able architectural writer (C. Woods), who says, 'It is certainly a beautiful edifice, the general proportions are good, and there is much grace and elegance in the outline, but there are also many defects.' Compared with the church of the Invalides the exterior presents a totally different style of design, and one marked by the audacity and spirit of the age. Instead of being merely posed as to create confusion, a single large one, whose columns are sixty feet high, forms a Corinthian hexastyle crowned by a pediment filled with sculpture; there are however twelve other columns, besides four attached ones, for the building is not of length from east to west but 295 feet, that of the transept 262, and the breadth uniform, namely, 104. Instead of pier-arches, the aisles are formed by insolated Corinthian columns 40 feet high, thereby producing an air of great richness and lightness. The doors are, the designs of Bérard; but, by the act of 1802, section of it, for we refer for an account of it to Dôme, pages 68 and 70, where will also be found a notice of that of the Invalides. The total length of the Pantheon, including the porico, is 442 feet.

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In the English one the width of that part is 36 feet, and its length to the transept 260; whereas in the other they are 42 and 181; consequently in the proportionate length the former is by far the greater, besides that which effect is increased by a greater number of divisions or arches, namely, twelve in the nave of Westminster Abbey, while the French have only ten; parisons here we subjoin some other measurements of the Abbey: externs, width, incl. St. George's, 500 feet; breadth of chapel 116, with a front 110, height of towers, including plinths, 330. The Town-hall has a width of 112 feet, a length of 268 feet, and the existence of an octostyle Corinthian porico, at least as far as respects the fronts alone, the columns are not continued at the other end; but it is by no means a happy application of such an arrangement to the effect of the columns and the building, improperly impaired by the large and numerous windows within them. Besides this, the raised main entrance is in a stylobate, on a softly retired basement with arched doors and windows.
by Trigls, with subjects bearing allusion to the Ten Commandments. The interior measures 259 feet by 52, and consists of three compartments in length, covered by as many flat domes, through which the building is lighted, there being no side windows. The roof is entirely of iron and copper, and it is said that no timber has been used in the construction of any part of the building.

The Louvre, which has long ceased to be a royal habitation, though one of the noblest palatial structures in Europe, is nearly a square, of 576 feet by 336, enclosing a court 394 feet square. The celebrated east front or colonnade is in a style of great elegance, and its unbroken appearance, except at the very reverse of the Tuileries. The fault usually alleged against it is the coupling of the columns, which is undoubtedly contrary to the practice of the antients, and consequent diminution of their height is thus produced. Yet the effect itself is by no means displeasing, or rather a peculiar species of richness is thus produced. Unfortunately the basement is not only too high and too plain for the order, which is exceedingly rich, but the size of the windows detracts considerably from the effect of the colonnade, while their form, which is sequential-headed, produces an offensive discord as to style. Another striking defect is occasioned by the break in the lower part of the centre division, and the large arch being carried up above the level of the basement, which looks as if it is the work of two different architects. Each regards the order itself, namely, the excessive width of the central intercolumnion beneath the pediment, which is much more than double any of the others—so wide as to produce the effect of a colonnade and where they ought to have been especially avoided: so far the centre compartment of the south front, or that towards the Sun, is in infinitely better taste. The great gallery extends from the Louvre to the Tuileries, in a line of more than 1,500 feet, but the most magnificent portion of it begins by mutually commensurate with the extent. The interior of the Louvre has undergone repeated changes and modifications, and among recent ones are the newly decorated rooms, eighteen in number, appropriated as a museum of Egyptian antiquities, a collection of Spanish paintings, which contains 405 pictures in five rooms.

The Luxembourg Palace, now the Chamber of Peers, was erected by Mary de Medicis, 1st a good specimen of its particular style (the Florentine), where the colonnades are introduced with rusticated columns and pilasters. It consists of a central and two wings, which latter are connected by a screen of arcades, in continuation of the lower order, decorated in the centre with a lofty pavilion or vestibule, in three storeys and flanked by a sort of court (about 196 feet by 230) from the street. One of the most splendid features of the interior is the grand staircase leading to the hall of the Peers, executed by Perere and Fontaine; the hall, or 'chambre;' itself is a sombre apartment, lighted from the roof, and decorated with Corinthian columns.

The Chamber of Deputies, formerly the Palais Bourbon, is remarkable for the modern façade towards the river and Pantheon. The whole extent of this side of the building is 236 feet, 136 of which form an advancing central mass faced by a Corinthian portico of twelve columns, leading up to which is an ascent of steps, about 15 feet high, flanked by pedestals and statues. Notwithstanding that it is only a single intercolumnion in depth, its portico makes an exceedingly majestic appearance, which is only owing to its unusual extent, and the richness of its antabulation and sculptured pediment, but to the absence of what generally mars all modern pseudo-Grecian designs. No part of the facade is devoid of sculpture, but every almost entirely of lightly rusticated surface, with no other decoration than panels filled with sculpture; while the doors within the portico occupy only the alternate intercolumniation. The 'sceaux,' which is behind the portico, is similar in plan to that of the Tuileries, and also adorned with the same lighted from above, and surrounded by an Ionic colonnade.

The Hôtel des Monnaies, or Mint, by Antone, on the Quai Conti, south of the end of the Pont Neuf, is a noble and harmonious edifice, although certainly without anything characteristic of its particular style. It has two fronts of nearly the same extent, 336 feet, one towards the Quai, the other in the Rue Guignebourg. The former is in three divisions, the centre one of which has an Ionic order in front.

The Bourse is a rectangular building standing in the centre of a large square or place. The form is a parallelogram, measuring 164 feet by 234, and is entirely surrounded by a Corinthian peristyle of sixty-four columns, of which there are fourteen at each end, besides which there are two others, viz. behind the second one from each angle of the west front, the portico being there two inter-columns in depth. The columns are 40 feet high and raised upon a solid stylobate of 12 feet. Each of the columns supports on the top of the attic or podium above the entablature, is rather more than 60 feet. As far as mere effect of columnation goes, this structure may be called classical, but it is without any useful purpose, and in a style criminally lavished upon it. As far as regards the general form, it is that of a Greek temple stripped of its pediments; consequently not only is a very disagreeable monstrosity produced, but, except the ascent at the ends, there is no marked architectural effect, marked, to be sure, by means of the entablature, and it further appears as if it had been intended that the building should be perfectly square. There is no occasion to object to the windows, &c. within the colonnades being arched, because the number above of those openings destroys their effect. The requisite height is given to the pediment of the portico of St. Martin's Church, London, when viewed by moonlight, so that the columns alone show themselves, and all that is behind them is veiled by obscurity, the Bourse is in the same state. According to the first architects, which had the same number of columns, the order was to have been Ionic; another difference is that, at the west end at least, there would have been no second range of windows, but a long pannil with sculpture and circular reliefs on each side, the offices of the Bank being on the lower floor, several offices and other apartments, and a large central hall for the Exchange—105 feet by 59 (exclusive of the arcades or galleries by which it is surrounded on both floors), and lighted by a central skylight in the vaulted roof.

The Palace of Versailles, in which the most of which will be found mentioned in the annexed table, we must notice three structures of a monumental class, which eclipse everything of the kind in our own metropolis—the Colonne Vendome, the Arc de Triomphe, and the Colonne de Juillet. The first mentioned of these falls short of the monument of London in magnitude, its entire height being only 122 feet, while that of the other is 202. It is indeed only a few feet shorter than the York column, and, in its general design, merely a copy of the original, the structure adorned with bronze reliefs, the work of thirty different artists, who executed them under the direction of Denon. The pedestal is likewise highly enriched, and it is this assemblage of sculptures which is the true merit and effect of the whole as a work of art, the reliefs, &c. being not so much necessary decorations to the columns, as the column is the form adopted for displaying the historical sculpture. The following are the respective diameters of the Monument, York column, and Versailles:—

<table>
<thead>
<tr>
<th>Monuments</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Versailles</td>
<td>202</td>
</tr>
<tr>
<td>York</td>
<td>182</td>
</tr>
<tr>
<td>Colonne Vendome</td>
<td>122</td>
</tr>
</tbody>
</table>

105 The Hôtel des Monnaies, or Mint, by Antone, is a single storey building, and consequently has no second story, and its elevation is 121.14m. In 1814 the bronze statue of Napoleon, in Roman costume, modelled by Claudet and cast by Meunel, was taken down, and afterwards recast to form the horse of the equestrian statue of Henri IV.; but a second bronze figure of Napoleon, in a military costume, on horseback, by Savoy, was put up July 29th, 1833. It is 13 feet high, set about a foot and a half more than the first.
The Arc de l’Etoile is, without exception, the most gigantic work of its kind either in ancient or modern times; nor can we perhaps give a better general idea of its colossal dimensions than by stating that eight such structures as Temple Bar, London, would stand within the great arch, that is, four in depth and as many above them, the arch of the Etoile being 47 ft. 101/2 in. wide, 96 ft. 6 in. high, and 73 ft. in depth. Thus structure is perfectly insulated, and forms a mass whose plan is 147 feet by 73, and its height 162, the effect of which extraordinary dimensions is greatly enhanced by its simplicity of form and its solidity; the outline being unbroken by columns and projecting entablatures, and the being only a single opening on each side, viz. the large arch in the direction of east and west, and the smaller one running transversely through the plan from north to south: the height of the latter is 60 feet, and the breadth 274. There are no columns or pilasters, and the architectural forms are exceedingly simple, but at the same time prodigiously rich: the entablature is 23 feet deep, and the frieze is entirely covered with figures in relief, besides which the mouldings of the cornice are carved, as are likewise those of the archivoltae and impost of the arches. An unusual degree of decoratation is also bestowed upon parts where it is often omitted altogether, namely, in the passages through the structure, where the soffits of the archivoltae and the vaults are richly painted and covered, and the pierfs formed by the intersection of the smaller arch are covered with wreaths and inscriptions. If it were remarkable for nothing else, this monument would be eminently so on account of the display of sculpture, there being four colossal groups of sculpture, one on each side of the arch in the east and west fronts, the height of which, including their pedestals, is upwards of 56 feet, and that of the figures themselves about 20. Corresponding with these, and above the cornice forming the impost to the large arch, are as many large bas-reliefs. The attic also has a great deal of sculptured ornament. Within the upper part and attic there is, besides some other rooms, a spacious hall, extending from end to end of the building. The Colonne de Juillet, erected on the Place de la Bastille, in commemoration of the second Revolution, is somewhat taller than that of the Place Vendôme, but similar in character, yet different in construction, the bronze exterior of the shaft consisting of twenty cylindrical bands or rings, not attached by cramps, but fitted into each other by grooves. The capital is to be cast in one mass, and it is proposed to surmount the whole by a bronze statue. Since Alavoine’s death, the execution has been entrusted to Lenoir and Duc. Under Oueux there is an account of the Luxembourg, now erected in the centre of the Place de la Concorde. Among other embellishments and architectural works, either recently completed or now in progress, may be mentioned the Ecole des Beaux Arts, on the quay between the Pont du Carrousel and the Pont des Arts, an edifice which partakes of the Renaissance style, and in front of which have been erected the portal of the Château d’Anet and that of Château Gaillon. There are also several other buildings, of which it would be premature to attempt to speak at present; for instance, the extensive alterations of the Hôtel de Ville, Palais de Justice, the Gothic church by Gau, in the Faubourg St. Germain, &c., as some time must elapse before they are completed. In fact every year makes some addition to the architecture of Paris.

| St. Germain des Prés | ded. 1163 | | |
| Notre Dame | 1010-1250 |雕像师 | Pierre de Montremon |
| La Sainte Chapelle | 1242-8 | | |
| St. Germain l’Auxerrois | | | |
| St. Severin | fin. 1495 | | |
| Hôtel de Cluny | 1490-1505 | | |
| St. Merry | 1520 | | |
| St. Etienne du Mont | 1532-42 | Mansart de Jouanneau Le Scot and Gougeon |
| Fontaine des Innocents | 1551 | | |
| Hôtel de Ville | 1533-1606 | | |
| Old Louvre | 1533-1608 | Le Scot | |
| Old Louvre du Mont | 1547 | | |
| Tulleries | 1564 | Delorme & Boulanger | |
| Pont Neuf | 1578-1610 | Du Cerceau | |
| St. Germain l’Auxerrois | 1581 | | |
| St. Germain l’Auxerrois | 1616 | J. Debrose | |
| Palais de Justice | 1614 | J. Debrose | |
| Palais du Luxembourg (Chambre des Pairs) | | | |
| Val de Grace | 1645 | Fr. Mansard | |
| Eglise de Sorbonne | 1650-3 | Le Mercier | |
| Collège Mazarin (Institute) | 1663 | Leveau | |
| Observatory | 1667-72 | Perrault | |
| Louvre, East front | fin. 1670 | Perrault | |
| Assumption, Church | 1670-8 | Ecart | |
| Hôtel de Ville | 1672 | Blondel | |

Table of Public Buildings.

A striking specimen of French architecture of its period. The chapel of the Virgin by Pierre de Montremon. Length 310 feet. Total length 442 feet. A beautiful Gothic edifice, divided internally into two stories. Gothic. Length 250 feet. Interior, five aisles and side chapels. A fine Gothic specimen. Now converted into a museum. Gothic. Interior Gothic. Two loggias, Doric and Ionic, and two towers, Corinthian. Now insulated, and forming an upright square pavilion, covered by a dome, and having a large open arch on each side. Remarkable for the beauty of the sculptures. Front a singular and unmelodious architectural mixture. Professedly adorned with sculpture. Interior Gothic. A barbarous medley, though rich in parts. Not only vicious, but positively ugly as to style, nevertheless grand and imposing; garden façade nearly 1100 feet. Length 926 feet. Twelve semicircular arches. In better style than any of the later bridges. A lofty mass, about 140 feet high, Doric and Ionic, with a third order, Corinthian, over columns Three orders rusticated; coupled columns; stately in character. Interior greatly altered by Chalgrin, &c. The Chamber of Peers, a semicircle 80 feet in diameter. A preposterous composition; façade in two orders, with pediments to both. Dome of enormously lofty proportions, the height being 177 feet, and diameter only 66. Hexastyle Corinthian portico; octagonal dome. Corinthian portico; four columns, those at the angles coupled with a pilaster. Dome with coupled pilasters and arched windows between them. Length 576 feet; façade in five divisions, centre and two pavilions connected by Corinthian colonnades of coupled columns, forming seven intercolonial bays. A rotunda of singular proportions, diameter 78 feet, height to top of dome 144 feet. Low façade, with hexastyle Corinthian portico. A structure marked by simplicity and grandeur. Width 82 feet, depth 22 feet, height 85 feet.
<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Architect</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palais de l’Elysée</td>
<td>1718</td>
<td>Mollet</td>
<td>An extensive pile greatly altered and extended at different times. Hall of Louis Philippe added by Joly about 1838. Two orders, Doric forming a loggia, Ionic on lofty pedestal with arcades between the columns. Two towers. Two orders, Doric and Corinthian. A showy architectural facade. Façade towards the Champ de Mars, 340 feet, centre a Corinthian tetrastyle. Two duplicate façades towards the Place de la Concorde. A low rotunda 228 feet diameter. What was originally an inner circular court, 127 feet diameter, was covered by a timber dome, by Ledragn and Molinos, 1732, which, being burnt, was replaced by the present metal one, 1806, by Bellanger. Portico 18 Corinthian columns (62 feet high), disposed in front of an hexastyle. Greatly praised, but in many respects very poor. Almost the only good feature is the Corinthian hexastyle portico within the court. By far the most tasteful specimen of church architecture of its period. Remarkable for its simple grandeur of character. The new front and court. The building first begun at this period, but quite altered by succeeding architects. Remarkable for the rusticated mass (forming the entrance) pierced by a single low arch 30 feet wide. Insignificant in style. The ranges of buildings and arcades towards the garden were erected about the same time. A façade of unusual simplicity and elegance with three large doors, niches and base-reliefs; no windows. The façade has more of a disagreeable affectation of severity than of either beauty or propriety. At one time greatly admired for its portico or hexastyle Ionic colonnade, though poor in style and without merit as a composition. This structure was burnt down in 1832. Its chief architectural merit, the gateway and Ionic screen of two rows of columns on each side of it. A stone structure of five flat arches; length 1063 feet. Front two orders, Doric and Ionic, with 9 arcades in each.</td>
</tr>
<tr>
<td>Palais Bourbon (Chamber of Deputies)</td>
<td>1722</td>
<td>Girardin</td>
<td></td>
</tr>
<tr>
<td>St. Sulpice, façade</td>
<td>1733</td>
<td>Seraundoni</td>
<td></td>
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<tr>
<td>St. Roche, façade</td>
<td>1736</td>
<td>De Cotte</td>
<td></td>
</tr>
<tr>
<td>Fontaine de Grenelle</td>
<td>1749</td>
<td>Bouguenaron</td>
<td></td>
</tr>
<tr>
<td>Ecole Militaire</td>
<td>1752</td>
<td>Gabriel, J. A.</td>
<td></td>
</tr>
<tr>
<td>Garde-muebles</td>
<td>1760</td>
<td>Gabriel, J. A.</td>
<td></td>
</tr>
<tr>
<td>Halle aux Blés</td>
<td>1762</td>
<td>Camus de Mezie</td>
<td></td>
</tr>
<tr>
<td>Ste. Génévière (Pantheon)</td>
<td>1764</td>
<td>Soufflot</td>
<td></td>
</tr>
<tr>
<td>Ecole de Chirurgie</td>
<td>1769</td>
<td>Gondouin</td>
<td></td>
</tr>
<tr>
<td>St. Philippe du Roule</td>
<td>1769-84</td>
<td>Chalgrin</td>
<td></td>
</tr>
<tr>
<td>Mint</td>
<td>1771</td>
<td>Antoine</td>
<td></td>
</tr>
<tr>
<td>Palais de Justice</td>
<td>1777</td>
<td>Moreau, &amp;c.</td>
<td></td>
</tr>
<tr>
<td>La Madeleine</td>
<td>1777</td>
<td>Contant d’Ivy</td>
<td></td>
</tr>
<tr>
<td>Hôtel Thelusson</td>
<td>1780</td>
<td>Lebouzou</td>
<td></td>
</tr>
<tr>
<td>Palais Royal, street façade</td>
<td>1781</td>
<td>Moreau</td>
<td></td>
</tr>
<tr>
<td>Lycée Bourbon</td>
<td>1781</td>
<td>Brogniart</td>
<td></td>
</tr>
<tr>
<td>Théâtre de l’Odéon</td>
<td>1782</td>
<td>Dewailly and Payre</td>
<td></td>
</tr>
<tr>
<td>Théâtre Italian (Favart)</td>
<td>1783</td>
<td>Heurtier</td>
<td></td>
</tr>
<tr>
<td>Hôtel de Sain (Palais de la Légion d’Honneur)</td>
<td>1786</td>
<td>Rousseau</td>
<td></td>
</tr>
<tr>
<td>Pont Louis Seize</td>
<td>1787-90</td>
<td>Perronet</td>
<td>A stone structure of five flat arches; length 1063 feet. Front two orders, Doric and Ionic, with 9 arcades in each.</td>
</tr>
<tr>
<td>Opera House (Académie de Musique)</td>
<td>1791</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Nineteenth Century.**

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Architect</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rue Rivoli</td>
<td>1502</td>
<td>Percier</td>
<td>A Corinthian peristyle of 52 columns (8 at each end) 62 feet high, raised on a stylobate 13 feet high. For foot-passengers only: arches cast iron, piera stone. Each front has four Corinthian columns (shafts red marble, and bronze capitals), with a central arch and two smaller ones. Stone cased with bronze reliefs; total height 141 feet. Width 147 feet, height 162 feet, depth 73 feet. Arch 47 feet wide, 96 feet high. Five arches, length 518 feet.</td>
</tr>
<tr>
<td>La Madeleine</td>
<td>1804-36</td>
<td>Vignon, Huré, &amp;c.</td>
<td></td>
</tr>
<tr>
<td>Pont des Arts</td>
<td>1504</td>
<td>Cassart &amp; Dillon</td>
<td></td>
</tr>
<tr>
<td>Arch of the Tuileries</td>
<td>1802-10</td>
<td>Percier &amp; Fontaine</td>
<td></td>
</tr>
<tr>
<td>Vendôme Column</td>
<td>1806</td>
<td>Gondouin &amp; Lepère</td>
<td></td>
</tr>
<tr>
<td>Aro de l’Etoile (Pont de Jonc)</td>
<td>1806-36</td>
<td>Chalgrin, &amp;c., finished by Dubret</td>
<td></td>
</tr>
<tr>
<td>Fontaine du Palmier</td>
<td>1806</td>
<td>Bralle</td>
<td></td>
</tr>
<tr>
<td>Pont des Invalides (Pont de Jonc)</td>
<td>1806-8</td>
<td>Lamandé</td>
<td></td>
</tr>
<tr>
<td>Portico, Chamber of Deputies</td>
<td>1807</td>
<td>Payot</td>
<td></td>
</tr>
<tr>
<td>Bourse</td>
<td>1808-1824</td>
<td>Brogniart &amp; Laborre</td>
<td></td>
</tr>
<tr>
<td>Hôtel des Affaires Etrangères (Quai d’Orsay)</td>
<td>1810-1837</td>
<td>Bonnard &amp; Leconte</td>
<td>An extreme pile, of which the projecting portion forming the façade towards the quay is 370 feet, and consists of two orders. Doric and Ionic, surmounted by an attic, and each containing 19 large arcades or windows.</td>
</tr>
</tbody>
</table>
The population of Paris at the end of the reign of Louis XVI (1791) has been estimated, by a calculation founded on the number of births, at upwards of 610,000. The troubles of the Revolution, and the emigrations consequent thereon, must have materially diminished the number, but on the comparative quiet which followed the overthrow of Robespierre, it is probable that the diminution was checked. The calculations formed in the years 1789-1806 exceed that of 1791; but these calculations can only be regarded as loose approximation to, and the population of a regular census in 1806-1808, the population, exclusive of the military, was shown to be only 506,609. The next census appears to have been in 1817, when a deficient harvest had led many desti- tute persons to resort to Paris. There were then ascertained to be 26,731 houses, and 224,922 families, comprehending 637,172 individuals. The hospitals, military establishments, prisons, hotels, and other places for individuals not domiciled, contained 37,424 persons; making a total of 714,596, of whom less than 105,000 (in round numbers) were pris- oners, inmates of hospitals, or persons residing on charitable relief. (Dulau, Histoire de Paris.) In 1826 the population was 890,431; in 1831, 774,338; and in 1836, 909,126. The extraordinary diminution in the return for 1831, as compared with the preceding return for 1826, and the small increase of return of 1836, was probably owing to some unobserved varia- tion in the districts included in the return. A remarkable feature in the return for 1817, and which may be considered as applying to the subsequent returns, is the number of families as compared with that of houses. The inequality is accounted for by the vast height of the houses, which are sometimes of eight stories in the older parts of the town, and by the practice of different families occupying suites of apartments in the same house, a practice not confined, as in London, to the humble classes, but common, as in Edinburgh, to all ranks.

The students of various classes form a considerable part of the population of Paris; and in the political excitement which preceded and followed the Revolution of 1834, they acted a very conspicuous part. In 1828 the Académie Uni- versitaria, or University of Paris, was attended by from 7000 to 8000 students; it is the most frequented university in the world. The other institutions for superior education were also attended by a great number of students, swelling the total number to nearly 18,000. There is also a con- siderable manufacturing population; for in the variety and extent of its productions of industry, Paris may vie with most cities of the world. The carpets of the manufactory of La Savonnerie, and the tapestry of the Gobelins are very renowned. The two establishments are now united at the Gobelins. Cashmir, silk, and woollen shawls; light wool-
PAR

and about 7½ feet high. The basement is a storehouse for wine and oil. Napoleon designed to erect a large covered meat-market (Halle à la Viande) near the Halle aux Blés.

The space cleared for the purpose (about 300 feet by 175 feet) has been fitted up with wooden stalls, and is appropriately as a market-place for meat: it is supplied with water by six fountains fixed against the wall (bornes-fontaines). The picturesque market (Marché à la Voltaire) is on the southern bank of the Seine opposite La Cité. It is a covered market, about 200 feet long and 150 wide, divided into three parts by rows of pillars and iron rails. The fish-market, near the Halle à la Viande, or meat-market, is a covered building, supported by a number of columns. The Marché des Innocents, for fruit, vegetables and fish, is on the open space in the same neighbourhood, surrounded by small shops for the market-people, and adorned in the centre by a handsome fountain. The Marché St. Germain, not far from the Luxembourg, is the largest and best constructed market in Paris; it is an open square of about 300 feet long by 240 or 250 feet wide, with a covered arcade or piazza all round, and having a fountain in the centre. There are vast cellars. The Halle aux Fins, or wine depot, on the south bank of the Seine, opposite St. Louis, the Louvre, is a vast enclosure, comprising extensive covered storage houses for wines and ranges of cellars. Besides the above there are several other markets, and some halls designed for the same purpose, that are provisions, as the wool depot, the cloth-hall, the leather-hall or market, &c. There are five abattoirs, or general slaughter-houses, in the outskirts of the city, three on the north side of the Seine, and two on the south side, commenced by Napoleon, and finished under the direction, by: they are of great extent, and under excellent regulation.

A considerable part of the southern quarters of Paris (including the Luxembourg Palace, the churches of St. Génez, St. Sulpice, and the Observatory) stands on excavations from which the stones were procured for the building of the city. A part of these excavations is occupied by the catacombs, or depositaries of the bones brought from the disused cemeteries in the heart of Paris. Nearly all the public buildings are without the enclosure of the city walls; that of Mont Louis, between the church of Pere La Chaise, on the north-east side of the city, is the principal.

The offices of the general government and the buildings connected with it are numerous. Paris is the residence of the king, who has the palaces of the Tuileries, the Louvre, and the Palais Royal; and the seat of the legislature, of which the Chamber of Peers meets in the Luxembourg palace, and the Chamber of Deputies in a building annexed to the Luxembourg, the battle, and the offices of the executive government, are chiefly in the neighbourhood of the Tuileries; the chief courts of law are held in the Palais de Justice, in the island of La Cité. The Cour de Cassation is the third court of the law of the kingdom. The Cour Royale of Paris has jurisdiction over the departments of Seine, Seine et Oise, Seine et Marne, Aube, Eure et Loir, Marne, and Yonne. The head-quarters of the first military division, which includes the departments of Seine, Seine et Oise, Seine et Marne, Aisne, Oise, Loiret, and Eure et Loir, are also at Paris.

For the purposes of municipal government, Paris is divided into fourteen parts, called 'arrondissements,' which are subdivided each into four 'quartiers,' as follows:

<table>
<thead>
<tr>
<th>Arrondissement</th>
<th>Quartier</th>
<th>Quartier</th>
<th>Quartier</th>
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</table>
There are numerous learned societies, at the head of
which is the Institute (Institut National), which for a
long time comprehended four departments (or, as they are
termed, sections) of the Académie des Sciences, des
Inscriptions et Belles-Lettres, and des Beaux Arts. A fifth,
Académie, that of the moral and political
sciences, has been added by Louis Philippe, the present
king. [Institut National].

The charitable institutions are numerous. There are
seventeen hospitals, five of them for the military. The
most important of the non-military hospitals is the Hôtel
Dieu, in the island of La Cité; of the military hospitals, the
Hôtel des Invalides. There are there thirteen hospices, or
asylums. Each of these is a monastery, and nearly one-third
of the destitute at their own habits; these bureaux distribu-
tion annually about 1,500,000 francs, or 60,000£, and
relieve from 60,000 to 70,000 persons. There are a variety
of other institutions for affording relief or giving em-
ployment to the destitute, and vast sums are distributed
every year through the medium of the clergy. Nearly
two hundred benefit societies exist among the working
classes.

There contains numerous places of amusement. There
are several theatres within the circuit of the town wall, and
others beyond the barriers; the most remarkable for their
architectural beauty are L'Opéra Comique, Le Grand
Opéra, L'Océan, and Le Théâtre Favart. Public balls are
conducted, and the Salons, much farther: they are held
in the Hôtels of the nobility, in the Palais Royal, and
the public gardens, especially the gardens of the
Tuileries and of the Palais Royal, and the Boulevards
are much frequented. Gaming-houses were numerous and much
frequented; it has been estimated that 11,000,000 francs,
or £600,000, were annually lost in the appearance of
these places. The establishments were licensed by the government, and paid a
heavy annual sum for their exclusive privilege. But since
the beginning of 1838 the system of licensing has been dis-
continued. [Gaming.] Carriages of every kind, public and
private, are much used. They are custumary one-third of
the children born in Paris are illegitimate. The number of
persons imprisoned in the department of Seine may be
on a yearly average be estimated at 25,000.

Universelle, 3rd ed., Paris, 1832, sec; Ballou, Abrégé de
Géographie, Paris, 1833; Dictionnaire Géographique
Universel, Paris, 1831; Paris and its Historical Scenes, in
the Library of Entertaining Knowledge.

PARIS, BASIN OF. [Seine, Department.]

PARIS, ABBE'. [Jansenists.]

PARIS, MATTHEW. was born about the end of the
twelfth century, took the religious habit in the Benedictine
monastery of Saint-Martin-des-Champs, and died there in 1239.
Almost the only incident of his life that has been recorded
is a journey he made to Norway, by command of the pope,
to introduce some reforms into the monastic establishments
of that country, which mission he has the credit of having
effectuated. Cambridge, there is one tombstone, which he is said to have
stood high in the favour of Henry III., and to have obtained
various privileges for the university of Oxford through his influence
with that king. His achievements embraced all
the learning and science of his age; besides theology and
history, oratory, poetry, painting, architecture, and a
practical knowledge of mechanics were reckoned among his ac-
complishments by his biographers or panegyrists.
His memory is now preserved by his history of England, entitled
Both Books of History and robberies, and
comes down to the year of the author's death. Of this
work the following are the printed editions: 1. Fol. Lon.,
1571, edited by Archer Parker; 2. Fol., Tiguri (Zürich),
1606, a mere reprint of the preceding; 3. Fol., Lon., 1640
1664. Watts's edition, which is sometimes divided into two volumes, besides various
readings and copious indexes, contains two other works of
the author never before printed, namely, his 'Duorum
Cum Aureliano Regum (S. Albani Fundatorum) Vite', and
his 'Viginti Trium Abbatum S. Albani Vite.' together
with what he calls his 'Additamenta' to those treatises; and
these minor productions are also given in the subsequent
of Cato's 'Histories' appeared, and an interesting
epitome, by Matthew Paris himself, of his History, generally referred to by the names
of the 'Historia Minor,' or the 'Chronica,' which has never been
published, but which, bishop Nicolson says, contains 'several particulars of note omitted in the larger History,' and some
other works, which are now lost, are attributed to him on
the doubtful authority of Bude and Pits. Some old notices
of his History speak of it as beginning at the creation of
the world; and on this account it has been conjectured,
though with no probability, that the historical compilation
ascribed to the fictitious personage Matthew of West-
minster, may really be that of Matthew Paris. The
portion extending to the year 1235 is very little more than a
transcript from the work of Roger de Wendorf, Windle-
store, or Windsor, who is said to have also been a monk of
his house. Matthew of Westminster's History is
a considerable spirit and rhetorical display; and his work,
which is continued to the death of Henry III. (A.D. 1272)
by William Rishanger, another monk of the same abbey,
have been the chief authority commonly relied upon for
the history of that reform. His spirit however is 'somewhat
fiercely and narrowly English; and from the freedom with
which he inveighs against what he regards as the usurpa-
tions of the papal see, Romanist writers have always ex-
pressed strong dissatisfaction especially with his accounts of
ecclesiastical affairs. Cardinal Buresh, in 1809, has
questioned his merits in other respects, characterises him as animated
by a most determined hostility to the apostolic see ('animus
infensissimo in apostolicam sedem'). Dr. Lingard goes
much further, and accuses him of being 'a contemptible
banality of this favourite historian; but this I may say, that
when I could confront his pages with authentic records or
contemporary writers, I have in most instances found the
discrepancy between them to be so great as to give to his narrat-
ing a considerable romance value. It is admitted however in the sentences which immediately
precedes, that this history or romance contains many original
and some valuable documents; 'but the writer,' it is
added, 'accustomed to lash the great, whether clergy or
laymen, seems to have collected and preserved every male-
and scandalous anecdote that could gratify his censorious
disposition.' With Protestant critics, on the other hand, Mat-
thew Paris has been a favourite, in proportion to the dislike
that has incurred from their opponents. Nicolson says, 'The
whole book manifests a spirit of extra-judicial rancour
and bitterness in its author, who furnishes us with so particular a
relation of the brave repulses given by many of our princes to
the usurping power of the Roman see, that it is a wonder
how such an heretical history came to survive thus long.'
At one time, it seems, used to be affirmed by the Roman
Catholics that the printed Matthew Paris was in many
things a mere modern fabrication of the Reformers; but
Watts, by collating all the manuscript copies he could find,
proves that the manuscripts, proved that there was no
foundation for this charge.

PARIS, also called ALEXANDER, one of the most
celebrated characters of the mythologic age, is said to have
been the son of Priam and Hecuba. In consequence of an alarm-
ing dream which his mother had previous to his birth,
Priam gave him to a slave to be exposed upon Mount Ida.
The order was obeyed, but upon returning at the end of five
days to the spot where he had exposed the infant, he found
that he had been nursed by a bear. The slave took the child
to his own home and brought him up as one of his own,
sons, among the shepherds of Mount Ida. When Paris grew up,
he became distinguished by his beauty and strength, and in
consequence of his success in repelling the attacks of wild
beasts was carried off by Str的就是, and his
'Viginti Trium Abbatum S. Albani Vite,' together
with what he calls his 'Additamenta' to those treatises; and
these minor productions are also given in the subsequent
of Cato's 'Histories' appeared, and an interesting
epitome, by Matthew Paris himself, of his History, generally referred to by the names
of the 'Historia Minor,' or the 'Chronica,' which has never been
story, and quotes some passages in the Iliad and Odyssey in confirmation of his opinion.

We read very little in the Iliad of the exploits of Paris. In the third book he engages in single combat with Menelaus, and is only saved from death by the intervention of Aphrodite. He wounds with his arrows Diomedes (xii. 369-363) and Machaon (xi. 505); and is mentioned in the twelfth book (l. 504) as a member of the division of the Trojan army. According to later poets, especially Achilles with one of his arrows. The manner of his death is variously told; but it is generally agreed that he was killed by Philoctetes with one of the arrows of Hercules. Later still, while on the Ida, he was married to Gnome, daughter of the river Cobren, who endeavoured to dissuade him from attempting to carry off Helen, but, unable to succeed in his endeavours, she told him to return to her if he was ever wounded, as she alone could save him. After being wounded by Philoctetes, Paris accordingly desired to be carried to Gnome; but offended by her desertion, she refused to heal him, and left him to his fate.

PARISH. This word is properly derived into the English language from the French paroisse, and the Latin parochia or paroeecta, and ultimately from the Greek paroikia (συνοικία). At the present day it denotes a circumscribed territory, varying in extent and population, with a single church dedicated to the same purpose as the city. The ecclesiastical minister is entitled by law to the tithes and spiritual offerings within the territory. In the early ages of Christianity the term appears to have been used in some parts of Europe to signify the district or diocese of a bishop, as distinguished from the archbishop or metropolis of the archbishop or metropolis of the archbishop or metropolis of the archbishop or metropolis. (Du Cange, Gloss. ad verb. ' Paroichia; ' Selden's History of Parishes, chap vi., sect. 3.) These large ecclesiastical provinces were gradually broken down into subdivisions, for which the word 'parish' was appointed, either exclusively, or occasionally, who were under the rule of the bishop, were set out of the common treasury of the bishopric, and had no particular interest in the obligations or profits of the church to which their ministry applied. This was the state of things at different times, which continued towards the end of the third century. After that period proprietors of lands began, with the licence of the higher ecclesiastical authorities, to build and endow churches in their own possessions; and in such cases the chaplain or priest was not paid by the bishop, but was permitted to receive for his maintenance and to the particular use of his own church the profits or the proportion of the profits of the lands with which the founder had endowed it, as well as the offerings and contributions thither for divine service. This appears to be a probable account of the origin and gradual formation of parochial divisions in almost all countries where Christianity prevailed; and Selden has satisfactorily shown that the history of parishes in England has followed the general course of events. After the introduction of Christianity into this country, the heathen temples and other buildings were converted into churches or places of assembly, to which the inhabitants of the surrounding district came to receive religious instruction from the minister, and to exercise the rites of Christian worship. As the members of the new religion increased, a single or occasional minister was insufficient for the purpose; and a bishop, with subordinate priests, began to reside in the immediate neighbourhood of the religious houses, having the charge of districts of various extent, comprehending towns and villages, and assigned principally with a view to the convenience of the inhabitants in assembling together at the church. Within these districts, or circumci, as they were called, which were precisely analogous to the diocesan parishes in other parts of Europe, the ministering priests itinerated for the purpose of exercising their shrining, but they always resided with the bishop. By degrees other churches were built to meet the demands for public worship, wholly or in part, within the parish, and supplied by the bishop from his family of clergy resident at the bishopric with ministers or curates, who were supported by the common stock of the diocese. For the performance of the ministrations in these districts was common; and whatever was received from tithes, offerings of devotions at the different altars, or by any other means given for religious uses, was made into a general treasury or stock for the ecclesiastical purposes of the whole diocese; and was applied by the bishop in the first place to the maintenance of himself and the college of priests resident with him at the church, and afterwards for distributions in alms among the poor and for the repairation of churches.

This community of residence and interest between the bishop and his attending clergy, who are often termed in the chronicles of those days episcopi cleru, constituted the notion of cathedral churches and monasteries in their simplest form. How long this community of things continued, though Selden expresses an opinion that it was in existence as late as the eighth century. (History of Parishes, chap. iv., sect. 3.) It has indeed been asserted by Camden (Britannia, p. 169,) that the archbishop of Canterbury divided his diocese into parishes about the year 636; but Selden proves satisfactorily that Honorius could not have made a parochial division in the sense in which we now understand the term; and that, if made at all, it was then in such a distribution into districts, then called parishes, as is above described, and which was so far from originating with Honorius, that it must have been nearly as ancient as bishoprics.

It seems most probable that the creation of parishes in England was not a simultaneous act, but was the gradual result of circumstances, and was not fully effected till near the time of the Conquest. (Hallam's Middle Ages, vol. i., p. 205.) After the increase of population, the means of divine worship supplied by the bishoprics and monasteries became inadequate to the wants of society, and lords of manors began to build upon their own demesnes churches and oratories, and the bounds of parishes and benefices were extended. Each founder assigned a definite district, within which the functions of the minister officiating at his church were to be exercised, and expressly limited the burthen as well as the advantages of his ministry to the inhabitants of that district. In these acts of piety were scattered, and were in aid of the common treasury of the diocese, they were encouraged by the bishops, who readily consecrated the places of worship so established, and consented that the clergy might receive for his maintenance, and for the use of that particular church, the tithes and offerings of the inhabitants, as well as any endowment or salary which the founder annexed to it. This endowment or salary usually consisted of a glebe, or a portion of land endowed to that purpose, which was indeed the only means of providing for the maintenance of the incumbent at a time when almost all the wants of life were supplied from the immediate produce of the earth, and, together with the right of patronage, made him a wealthy man, and greatly increased the value of the living. Within the territory limited by the founder, became the settled revenue of the church, and annexed to it in perpetuity. The last concession made to the lay-founder was the right of presenting the clerk to the church, by the founder, exclusively to the bishop; and when this was obtained, these limited territories differed in no material respect from our modern parishes. Indeed it can scarcely admit of doubt that our parochial divisions arose chiefly from these lay-foundations, the differences in extent being accounted for by the varying limits appointed for them at their origin. Their names were derived from some favourite saint, from the site, or the lordship to which they belonged, or from the manor. It is probable that some parishes have not to have been the origin of the lay parishes; and it is reasonable to conclude that as soon as this practice was established, the bishops and religious houses, in the dioceses or parishes in which they had reserved to themselves the right of presenting, followed the same practice, and devolved their ecclesiastical profits of each church to the particular incumbent, and respecting the devotions as well as the offerings of the inhabitants to that church only. The same observation may be made of the ecclesiastical foundations of parishes is by Bodo, about the year 700 (Hist. Eccle. lib. vi. c. 4 and 5.) By the end of the eighth century they had become frequent, as clearly appears from the charters of confirmation made to Croyland Abbey, by Berthulf, king of Mercia, in which church the churches of lay foundations are contained. In the laws of king Edgar (A.D. 973) there is an express provision that every man shall pay his tithes to the most ancient church or monastery where he bears God's service; 'Which I understand not otherwise,' says Selden, 'than any
is in fact one of the reasons assigned by Camden for the difference between the number of the parish churches in England and Wales stated to Henry VIII. in 1520, by Carll Welsey, and that stated about a century after, by James I., the former being 9407, and the latter 9284. (Camden's Britannia, 161-2.) The sum total of the parishes mentioned in Pope Nicholas's 'Taxation' above referred to, as accounted for to the Crown, appears to be between those two accounts. Blackstone says that the number of parishes in England and Wales had been computed at 10,000, but gives rather a questionable authority for his statement. (Commentaries, vol. i., p. 111.) In the matter of the number of chapels and parochial chapellies in England and Wales is said to be 10,700, and in Scotland 948; but in the next page, where a summary of the number of parishes in the different dioceses is given, the total is stated as 11,077. Perhaps the number of parishes in England and Wales (meaning by the term simply a district annexed to a church whose incumbent is by law entitled to the per ception of tithes in that district) may be taken to be about 11,000. (See Holland's Observations on the Origin of Parishes, in Hearne's Discourses, vol. i., p. 194; and Whitaker's History of Whalley, book ii., chap. 1.)

PARK. This term, in its legal signification as a privileged enclosure for beasts of the forest and chase, is at the present day nearly extinct. Under the Great Charter the franchise of the highest degree was that of a forest which was nomen generalliusim, and contained within it the franchises of chase, park, and warren. The only distinction between the two was that the latter was enclosed, whereas a chase was always open; and it both differed from a forest, inasmuch as they had no peculiar courts or judicial officers, nor any particular laws, being subject to the general laws of the forest; or, as Sir Edward Coke remarks, the forest was a form of a royal warren (4 Inst., 314.) A chase and a park differ from a forest also in the nature of the wild animals to the protection of which each was applied. The beasts of the forest, or beasts of venery, as they were called, were tantiim silvatis, that is, Manxowne excluded. (Blackstone's Commentaries, vol. ii., sec. 4), animals such as the hart, hind, hare, boar, and wolf, which 'do keep the everiers, and haunt the woods more than the plains.' On the other hand, the beasts of chase or park were tantiim compestres, that is to say, they haunted the plains more than the woods. According to the strict legal meaning of the term, no subject can set up a park without the king's grant, or immemorial prescription, which is presumptive evidence of such a grant. In modern times the term is little known, except in its popular acception as a name for a bournal enclosure or deer park, the real purpose of keeping fallow deer, interspersed with wood and pasture for their protection and support. (Blackstone's Commentaries, vol. ii., p. 38.)

PARK, MUNGO was born on the 10th of September, 1771, at Fowleshills, a farm on the banks of the Yarrow, not far from the town of Selkirk. His father, an intelligent and successful farmer, died in the year 1792, but not until Mungo had been fairly launched into professional em-}
life, except that he devoted considerable attention to botany. Any spontaneous inclination he might feel towards botanical pursuits must have been confirmed and encouraged by associating with his brother-in-law Mr. James Dickson, who, having settled in London as a nurseryman and seedsmen, and having attracted the notice of Sir Joseph Banks, had acquired considerable reputation as a botanical artist. A tour which Park made through the Highlands with this gentleman during one of the summers of his college life contributed much to his progress in the science of botany.

On the completion of his studies at Edinburgh, Park repaired to London. Mr. Dickson introduced him to Sir J. Banks, through whose interest he obtained the appointment of assistant-surgeon to the Worceste, East Indiaman. He sailed in that vessel in the month of February, 1792, on a voyage which he afterwards returned in the month of the following year. He availed himself of the opportunities afforded him by this voyage to extend his acquaintance with natural history. The third volume of the Linnean Transactions contains a paper read by Park on the occurrence in the range of eight fishes new to the waters of Sumatra, which represents as the fruits of his leisure hours during his stay on that coast.

At the time of Park's return, the exertions of the African Association had concentrated a strong interest upon that quarter of the globe. Under the guidance of Major Rennell, the Association had collected and published, in a systematic form, a considerable amount of information relative to that area. The moment more especially engaged their attention was the existence and course of the river mentioned by some ancient geographers by the name of Niger. Intelligence had been recently received of the death of Major Houghton, who had been sent out by the Association, and engaged for the discovery of the course of the Niger, and much difficulty was experienced in finding a successor. Park's attention was naturally attracted to the subject through his connection with Sir Joseph Banks, one of the most active and influential members of the committee. A liberal offer was made to any person willing to undertake the arduous mission who should be found qualified for it. Park had a general passion for travelling; he was in the full vigour of youth; he had some experience of a hot climate; he was not mistrustful to the possibility of being detained by a discovery in African geography: he offered his services to the Association; and, after inquiry into his qualifications, the offer was accepted. Two years elapsed however between his return from India and his departure on his African expedition. With the exception of a visit to Edinburgh, occupied by a trip to Scotland, in 1794, he seems to have resided during the whole of that period in London or the neighbourhood, chiefly occupied in acquiring the knowledge and making the preparations necessary for his undertaking.

He left England on the 22nd of May, 1795, and reached Pisaia, a British factory about 200 miles up the Gambia, on the 5th of July. Here he remained several months in the house of Dr. Lasley, learning the Mandingo language, and collecting information concerning the country. For two of these months he was confined by a fever contracted by imprudent exposure during the rainy season.

He left Pisaia on the 2nd of December, 1795. After passing through the territory of a number of petty native chiefs, he was induced, in order to avoid the suspicion of being a spy, which might have attached to him had he passed from the territories of the chief of Kaarta into those of the chief of Bambara, those sovereigns being then at war, to adopt a more circuitous route across the country which was then governed by the chief of a predatory band of nomade Moors. He reached Yarra, the frontier town of this state, on the 16th of February, 1796. All the Moors chief, detained him a captive till the 1st of July. When Park made his escape and returned manfully against his accoutrements, a few articles of clothing, and a pocket-compass, which he had saved from the Moors by concealing it in the sand. Undaunted by his capture and lonely condition, he pushed on to the Niéli Aboh, or Julia, which he had learned the locality of by his former journey, then traversed the stream downwards to Silla and upwards to Bamarak, then crossed a mountainous country to Kamalif, a Mandingo town, which he reached on the 14th of September. Here, 906 miles from the nearest European settle-
PAR

view with Lord Hobart was his acceptance of the proposal from government that he should command an expedition of discovery into the interior of Africa, and that the expedition should leave England before they have felt, or the cabinet caused a postponement. Doubts that began to be entertained of the practicability of the attempt occasioned a further delay. It was not till the 30th of January, 1805, that Mr. Park actually sailed from Portsmouth. The news reached him in his first journal, and the changes of government, in obtaining a knowledge of the Arabic language, and improving himself in the practice of making astronomical observations.

Park had adopted Mr. Maxwell's opinion, that the Congo and the Niger were identical; and his plan was, with a supply of merchandise sufficient to defray travelling expenses, and a body of soldiers sufficient to ensure immunity from hostile attacks, to cross from the Gambia to the Niger, and then sail down the stream to the ocean. The expedition, as it started from Foutamou, consisted of himself, his brother-in-law Mr. Anderson, surgeon, and Mr. George Scott, draughtsmen to the expedition, five artificers from the Royal dock-yards, Lieutenant Martyn and 33 privates of the Royal African corps stationed at Goree, and Issaaco, a Mandingo, a priest and trader, the guide. Supplies for a voyage of 11,000 miles had been purchased at St. Jago and Goree to carry the merchandise. The expedition left Pissana on the 4th of May, 1805.

The journal completed up to the time of his departure from Sansanding, and some letters which he despatched along with it, bring the narrative of his adventures down to that period. To Mrs. Park he wrote, on the 19th of November:

'...We have already embarked all our things, and shall sail the moment I have finished this letter. I have given Lord Camden (Lord Hobart's successor in the colonial office), I am sorry to say that of forty-four Europeans who left the Gambia in perfect health, five only at present are alive, viz., three soldiers (one deranged in his mind), our kinsman, and the fakir. We had no contest whatever with the natives, nor was any one of us killed by wild animals or any other accidents.

...Your lordship will recollect that I always spoke of the rainy season with horror, as being extremely fatal to our health and general survival. The natural observation is, I think, the only proof of it.' Issacco stated on his return to the Gambia that Mr. Park arrived at Foulah Dougui with thirty-six white men; and from Foulah Dougui to Sego (which was eight days' march, but which is generally performed in three days and a half), they lost twenty-six men by the rains, dysentery, &c.

At Sansanding, Park dismissed Issacco, and took, upon his recommendation, a man named Amadi Fatoumou to guide him to Boussa. From this man he procured the only description he could obtain of the peoples and their customs, and his companions that has been obtained. His accuracy is established by a strong body of circumstantial evidence: the traditions of the fate of some white men, collected by Clapperton and Lander, on the spot where Foutomou's proceedings, in his journal, speak of a white man, and dated 'Strand, 9th November, 1804.' The story of Amadi Fatoumou, corroborated in its essentials by these circumstances, is briefly this: that in sailing down the Niger they had repeated engagements with the natives; that on arriving at Yorou, Fatoumou's engagement having terminated, he quitted Mr. Park; that after Mr. Park's departure, the chief of Yorou informed the king (falsehood) that the white men had departed without giving the customary present; then the king in rage imprisoned Fatoumou, and armed for the white men at the narrows of the river; that on his release from prison Fatoumou learned from a slave (the only survivor of Park's party) that during a skirmish which ensued the boat was sucked into a rapid, and that the white men, in attempting to make their escape, were drowned.

Thus perished Mungo Park, towards the close of 1805, in the thirty-fifth year of his age. In person he is said to have been tall and athletic. His manner was cold and reserved, attributable in part to that awkwardness which men conscious of their own powers are apt to feel in society when the circumstances of their early life have kept them from mingling with it. His last letter to Mrs. Park (in which he affirms a degree of confidence and hope he could not possibly have felt, had he not imbibed them, together with the striking language of his last letter to Lord Chatham, show the power of his determination and perseverance. His acquirements in natural history were necessarily limited; for in Scotland, where he laid their foundation, that branch of knowledge was only beginning to attract attention. His letters to London were brief, and occupied with other matters. It was not till the eve of his departure on his second journey that he acquired the Arabic language, not only the best medium of communication with the Moors and Arabs, but also to the extent of his understanding and his intercourse with astronomy does not seem, even at the time of his second journey, to have gone beyond the power of making with accuracy the necessary observations for the determination of latitudes and longitudes; and at the time of his first journal he was too much engaged in the study of observing for the latitude with the sextant. On his first journey he lost all his instruments, with the exception of a pocket-compass, when taken prisoner by the Moors; on his second journey he was better provided; but his only chronometer seemed as if it had been taken away. The defects, however, in instruments and apparatus were to a great extent counterbalanced by a calm courageous self-possession, an unwearied power of observation, and a modest and amiable veracity that enables us to rely upon his statements as in no instance exaggerated.

Almost the whole of the country which he traversed may be regarded as having been before him unvisited by Europeans, and nothing of any moment has been added since his death to the knowledge of the ignorant Arabs of his first journey exposed him to misapprehend the Arabs; but his detention in a Mandingo village enabled him to master the domestic life of the negroes and their civil and economical organization. His meteorological and topographical observations are invaluable; and so is his careful and acute observation of the phenomena of the stars. Wolckner and his echo Bouditch have impugned the trustworthiness of his observations for longitude on his second journey, on account of an entry in his journal, '31st April,' that month having only 30 days. But Oitmanns has satisfactorily shown, in an elaborate paper, in the 'Transactions of the Berlin Royal Academy,' by comparison of the data stated in Park's journal with the Ephemerides of the 'Nautical Almanace' for 1805, that whatever oversight he may have written '31st April,' he was perfectly correct in noting the time of certain observations. On the other hand Oitmanns has pointed out a circumstance which vitiates Park's calculations of his observations for longitude: the confusion arising out of the substitution, without sufficiently explicit warning, in 1805, in the Ephemerides, of July for June, which would have caused the time for apparent time in the tables for the eclipses of Jupiter's satellites. Unluckily Park has stated only in one instance (Bee-creek) the whole of the data upon which his longitudes were calculated; and consequently in that one instance none of the observations he has overlooked may be corrected. Only one opinion can be entertained of the sound judgment displayed by Park in his conduct during his first journey as a solitary traveller. His judgment in the estimation of obstacles and the calculation of forces by which he was overwhelmed in the expedition in which he published was more open to challenge: but he did not seek to shun the consequences. A question regarding the degree of credit due to him in a literary point of view for the narrative of his first journey and his first volume is, I think, clear that, unacustomed to literary composition, he formed his book upon the model of Bryan Edwards's abstract; but that it was his own composition there seems no good reason to doubt. Either owing to natural good taste, or a large want of facility in sensuous turning, his style is far less turgid than that of his model.

Park left a widow and three children. Mrs. Park died in the month of February in the present year: it is believed that none of her children have survived her.
PARK, an assemblage of the heavy ordnance belonging to an army, with its carriages, ammunition wagons, and stores, on ground contiguous to that which is occupied by the troops when encamped.

The park is formed in the immediate vicinity of roads by which the artillery may be readily moved to any spot where its service may be required: it is usually in rear of the troops, the guns being arranged in one line if the ground will permit, and if not, in two or more lines, as the case may require. The park is, for preventing the intrusion of improper persons, surrounded by chausse-de-frise or other obstacles. At the siege of a fortress the park is situated between the army and the place, and it should be beyond the range of shot or shell from the fort or batteries. If possible, it is frequently placed, if not on a high ground, on a spot where the artillery may be speedily brought up to the trenches or batteries.

In determining the extent of a park, 10 feet along the front are allowed for each gun; and since the limber and the ammunition wagons are placed in rear of the guns in one line, and in the direction of the depth, the latter must necessarily be sufficient for these, as well as to permit the horses to be attached to the carriages. The guns of each different calibre cannot be placed in the same line, as the result of the necessity of the latter will fall into the park which is nearest to the point of ground to be occupied by them when in position; but the artillery is sometimes arranged in the park according to its calibre, the heaviest being on the right or back of the line. The guns are turned towards the front of the line: if the guns are liable to be suddenly called for, the shafts of the limbers and the trails of the guns are then placed in that direction for the sake of a more speedy removal.

It is called, in certain cases, a solid or a banked at a certain distance from and opposite the middle of the front of the park: the gunners' tents are arranged along the two flanks; those of the commissioned officers are in the rear; and behind them, generally, the horses are picketed in one line or more rows. The horses are to be used for the gun. At the siege of a fortified place, the stores of gabions, fascines, and other materials used in the operations of the attack, as well as the spades, axes, and other tools for executing the trenches, raising batteries, or cutting down obstacles, are placed in the interior part of the park, for the purpose of keeping them in security and near at hand when wanted: this constitutes what is called the engineers' park. Like that of the artillery, it is situated where it may be concealed from the view of the enemy, and where means exist for a ready communication with it. The engineers' park, in the front, is usually a causeway of the garrison, in a sort, actually ruled through the engineers' park, on which occasion the whole store of materials collected by the besiegers might have been destroyed.

Two French service two parks were sometimes formed for the artillery: a great park for the guns, carriages, &c., and a small park to contain the working places for the carpenters and armourers, with the materials for making the repairs of the guns constantly required during a campaign.

PARKER, MATTHEW, born 1610, died 1657, is best known for his name in the catalogue of illustrious Englishmen. That he attained to the highest dignity in the English church is not the sole proof of his claim to be so spoken of; but that he was an eminent scholar as well as great church man, was sufficiently manifested as well as his proficiency in theological learning, and that he was archbishop of Canterbury in that critical period when the English Protestant or Reformed Church was in its infancy, and that he fulfilled the purposes of those who placed him in that high dignity by the skill with which he conducted the very difficult operations necessary at that time for its formation in a certain order and its perpetual existence.

Parker was a native of the city of Norwich, educated in Corpus Christi College, Cambridge, being elected for the M.B. in 1623, but afterward was so diligent in the study of the Scriptures and the fathers, that before he was thirty he was fixed upon by Wolsey to be one of his professors in the college which he meant to found at Oxford. This honor however Parker declined, probably in consequence of his having attached himself to the reforming party in the church; which was some of the more eminent of whom he was by that time become intimate. At this early period of his life he had a licence to preach.

He was attached to Queen Mary, by which it was hoped to re-establish the church in its former state and order, was deprived of the married clergy of all their benefices and preferments, thus removed from the church at one stroke to no small number of the more zealous reforming divines. It is marvellous that Parker fared no worse in the reign of Mary. It does not appear he had long found it necessary to leave England, but rather that he continued to live quietly in the eastern counties, pursuing his theological studies.

Very soon after the death of Mary, and when Elizabeth had ascended the throne, he was summoned from his retirement to the chancellorship of Westminster, and was immediately admitted to one of the dignities of the see of Canterbury. His consecration took place on December 17, 1559.

He was archbishop more than fifteen years, during which time he was assiduously employed in writing or revising books of the church, and of the church's use, and was the most active in that consistency and order which the church of England has since maintained. We cannot enter into the detail of what he did, but we must not forbear to mention that the preacutage of his works was performed under his auspices, and that the work was completed in 1568. Whoever wishes for more information respecting the labours of this eminent father of the English Protestant church, and the minute particulars of his history is made familiar with the church of England, may be abundantly supplied by consulting the folio Life of him written by the indefatigable Strype.

Parker is not to be estimated solely by what he did as an ecclesiastical. He collected a large library of valuable manuscripts, which he gave to his college in Cambridge, where but a few of the most valuable, of the scope of literature, has been lost by the destruction of the manuscripts still remain, having been very carefully preserved. There is a minute and excellent catalogue of them in print by Nasmith, who made also a catalogue of the manuscripts in the Public Library at Cambridge, which has been published.

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PARKER, SAMUEL, born 1640, died 1657, a prelate of the English church, was of Puritan extraction, and was remarkable for certain Puritan extravagancies, when, as a young man, he entered Wadham College, Oxford. But at Oxford he became acquainted with several persons of a very different turn of mind, and particularly with Dr. Ralph Bothurst, who is said by the writers of his life to have been chiefly instrumental in drawing him away from a path which he had entered 1675, when he had an active pen, which he employed about the time of the Restoration, and for a few succeeding years, in repeated attacks on the Puritan, or, as it then was become, the Non-conforming party. The controversy is almost forgotten, and we think it needless to recount the tales of his tract.
When King James II contemplated the re-union of England to the general church, with its head in the Roman pontiff, he looked among the English divines for persons who might be willing to assist in his designs, and, amongst other persons, he fixed upon Parker, who was made bishop of Oxford, in January 1686; and when he was deprived of the presidency of Magdalen College, it was given to Parker. It is said that he was strongly inclined to popery; but how far he would have gone with the king in that direction, he was fully determined, as his life was cut short soon after he had obtained this dignity. He died at Magdalen College, on May 20, 1687.

The only writing of Bishop Parker of any permanent reputation is a treatise entitled 'De Rebus sub Temporibus Commentarius.' This treatise was published till 1726; when it was given to the world by his son, a second Samuel Parker, an eminent non-juring divine.

PARKHURST, JOHN, was the second son of John Parkhurst, Esq., of Catesby in Northamptonshire. He was born in 1634, and was educated at Eton College, and afterwards at Clare Hall, Cambridge, where he took his degree of B.A. in 1748, and that of M.A. in 1752. He was for some years a fellow of his college. He took orders in the church of England, but never obtained any preferment; and he lived a quiet monastic life, which rendered him independent. He acted, without receiving any salary, as curate of the church at Catesby, the preferment of which was in his own gift.

In 1734 he married Susanna Myster, daughter of John Mysler, of D Google-11, who was the second son of the Reverend Mr. Mysler, patron of Catesby. She died in 1759, leaving him a daughter and two sons. In 1761 he married Millicent Northey, by whom he had a daughter, Mrs. Thomas, who became eminent for her learning; she wrote her father's epitaph in Epsum church.

He died on the 31st of March, 1797. He was a man of great integrity and firmness of character. He always lived in retirement, though he possessed qualities which fitted him to shine in society. In spite of a weak constitution, he was a most laborious student, rising for many years at two o'clock in the morning.

His first work was 'A Serious and Friendly Address to the Rev. John Wesley,' remonstrating against the doctrine of the faith of assurance as held by that divine; it was published in 1753. In 1762 he published the first edition of his 'Hebrew and English Lexicon, without Points,' with a Hebrew grammar, which has passed through several editions. His 'Greek and English Lexicon to the New Testament,' with a Greek grammar, appeared in 1769. Of this work there are several editions, both 4to. and 8vo.; the first of the octavo edition appeared in 1781, with notes by Mrs. Thomas. A new edition, by the Rev. Hugh James Rose, B.D., was published in 1829. The only other work published by Mr. Parkhurst was 'The Divinity and Pre-eminence of Our Lord Jesus Christ, extracted from Scripture, in answer to the First Section of Dr. Priestley's Introduction to the History of Early Opinions concerning Jesus Christ,' Lond., 1787, 8vo. Dr. Priestley replied to this work in 'A Letter to Dr. Horne.'

PARKING, JOHN, A.D. 1915, in all probability, is the man referred to that prince, wherein he promises to summon all archbishop shops, bishops, abbots, earls, and greater barons [BARONS] personally, and all other tenants in chief under the crown by the sheriff and bailiffs, to meet at a certain place, with fasting and prayer, and with a certain form and mode of proceeding; and this constitution has subsisted, in fact at least, from the year 1266, 49 Hen. III., there being still extant writs of that date to summon knights, citizens, and bur gesses to parliament.' A statute, also, passed 15 Edw. II. (1382), declares that 'the matters to be established in the estate of the king and of his heirs, and for the estate of the realm and of the people, shall be treated, accorded, and established in parliament, by the king and by the assent of the prelates, earls, and barons, and the commonalty.' In reference to this statute Mr. Hallam observes that it not only establishes by a legislative declaration the present constitution of parliament, but recognises it as already standing upon a custom of some length of time. (1 Const. Hist. 5.)

CONSTITUENT PARTS OF PARLIAMENT.

These have been treated of in separate articles, and nothing more will be attempted in this place than a brief analysis, which will bring the whole under one view. Of
the king (or queen), the first in rank, nothing need be repeated.

The House of Lords is at present composed of—

**LORDS SPIRITUAL.**
- 2 archbishops (York and Canterbury)
- 24 English bishops
- 4 Irish representative bishops

**Total, 30**

**LORDS TEMPORAL.**
- 3 dukes of the blood royal
- 21 dukes
- 20 marquesses
- 113 earls
- 20 viscounts
- 211 barons
- 16 representative peers of Scotland
- 28 representative peers of Ireland

**Total, 432**

The number has been greatly augmented from time to time, and there is no limitation of the power of the crown to add to it by further creations. The introduction of the representative peers of Scotland and Ireland was effected on the union of those kingdoms respectively with England. The former are elected by the hereditary peers of Scotland descended from Scottish peers at the time of the Union, and sit for one parliament only; the latter are chosen for life by the peers of Ireland, whether hereditary or created since the Union. The power of the crown to create Irish peers is limited by the Act of Union, so that one only can be created when three of the peersages of Ireland have become extinct.

The present composition of the House of Commons is as follows:

**ENGLAND AND WALES.**
- 159 knights of shires
- 341 citizens and burgesses

**Total, 500**

**SCOTLAND.**
- 30 knights of shires
- 23 citizens and burgesses

**Total, 53**

**IRELAND.**
- 64 knights of shires
- 41 citizens and burgesses

**Total, 105**

The total of the United Kingdom, 658.

An account of the changes effected in the parliamentary constituencies at different times, more particularly by the Reform Act, and a full view of the present system of representation, is given in the article COMMONS, HOUSE OF.

The lords and commons originally were one assembly, but the date of their separation is not known. Sir Edward Coke states that he had seen a record, 30 Hen. I. (1130), of their degrees and seats as one body, and affirms that the separation took place at the desire of the commons. (13 Statute Trials, 1410.) Kipps says that "the commons ever had a place for their consultation apart from the lords, though they did often meet and sit together in one room," and gives several precedents in support of his position. (Manuscript Notes of Parliaments, pp. 101-104, 155.)

**POWER AND JURISDICATION OF PARLIAMENT.**

**1. LEGISLATIVE AUTHORITY COLLECTIVELY.**—The authority of parliament extends over the United Kingdom and all its colonies and foreign possessions. There are no other limits to its power of making laws for the whole empire than those which are common to it and to all other sovereign authority, the willfulness of the people to obey, or their power to resist them. It has power to alter the constitution of the country, for that is the constitution which the last act of parliament has made. It may take away life by acts of attainder, and make an alien be as a natural-born subject.

Parliament does not in the ordinary course legislate directly for the colonies. For some, the queen in council legisvates, and others have legislatures of their own, and

proposed laws for their internal government, subject to the approval of the queen in council; but these may afterwards be repealed or amended by direct statutes from this country. Their legislatures and their laws are both subordinate to the supreme power of the mother country. The constitution of Lower Canada is at the present moment (April, 1849) suspended; and a provisional government, with legislative functions and great executive powers, has been established by the British parliament. St. Vincent was abolished by act of parliament in 1833 throughout all the British possessions, whether governed by local legislatures or not; but certain measures for carrying into effect the intentions of parliament were left for subsequent enactment by the local bodies by the executive council. The House of Assembly of Jamaica, the most ancient of our colonial legislatures, neglected to pass an effectual law for the regulation of prisons, which became necessary upon the emancipation of the negroes, and parliament immediately interposed and passed a statute for that purpose. The Assembly is indignant at the interference of the mother country, and neglected their functions, until an act was passed by the imperial parliament suspending the constitution of Jamaica unless they resumed them.

The right to imposing taxes upon colonies for the support of the parent state was attempted to be exercised by parliament upon the provinces of North America; but this attempt was the immediate occasion of the separation of that country from our own. The injustice and hardship of colonial taxation must be admitted. Parliament has power of imposing such taxes can only be restrained by its own acts conferring constitutions and privileges upon the colonies, which are all subject to its authority.

These subjects indeed upon which parliament in familiar language, is said to have no right to legislate, such for instance as the Church; but no one can argue more by that expression than that it is inexpedient to make laws as to such matters. The very prayers and sermons of the Church are prescribed by statute. Parliament has changed the religious religion of the country, and has altered the hereditary succession to the throne. To conclude, in the words of Sir Edward Coke, the power of parliament is so transcendent and absolute, that it cannot be confined, either for causes or persons, within any bounds.

**2. DISTRIBUTION OF POWERS BETWEEN KING, LORDS, AND COMMONS.—Custom and convenience have caused different branches of the legislative peculiar powers. These are subject to any limitation or even translation which parliament may think fit. The king swears at his coronation to govern according to the statutes in parliament agreed upon," and these of course may be altered. Prerogatives of the crown which have ever existed might yet be taken away by the king, with the consent of the commons, or his ministers, who are responsible to parliament. Without entering into views of prerogatives, which are treated of elsewhere [King], it will be necessary to advert to certain parliamentary functions exercised by him, and which are most important in the conduct of legislation.

**Summons.**—It is by the act of the king alone that parliament can be assembled. There have been only two instances in which the lords and commons have met of their own authority, namely, previously to the restoration of King Charles II.'s reign declared the lord and commons to be the two houses of parliament, now standing the irregular manner in which they had been assembled, and all their acts were confirmed by the reassembled parliament summoned by the king; which however qualified the confirmation of acts passed in the former manner of the assembling, enforced by the difficulties and exigencies which then lay upon the nation, it is not to be drawn into example. In the same manner the first act of the reign of William and Mary declared the convenion of lords and commons to be the two houses of parliament, as if they had been summoned according to the usual form, and the succeeding parliament recognised the legislature.

But although the king may determine the period for calling parliaments, his prerogative is restrained within certain limits, as he is bound by statute to send
writes within three years after the determination of any parliament; while the practice of providing money for the public service by annual enactments renders it compulsory upon them to meet the call.

There is one contingency upon which the parliament may meet without summons, under the authority of an act of parliament. It was provided by the 6 Anne, c. 7, that 'in cases where should be no parliament in being at the time of the demise of the crown, then the last preceding parliament should immediately convene and sit at Westminster, as if the said parliament had never been dissolved.' By the 37 Geo. III., c. 127, a parliament so revoked would only continue in existence for six months, if not sooner dissolved.

As the king appoints the time and place of meeting, so also at the commencement of every session he declares to both houses the cause of summons by a speech delivered to them in the house of lords by himself in person, or by commissioners to meet the houses in any business. Whatever has been done this, neither house can proceed with any business.

The causes of summons declared do not make it necessary for parliament to consider them only, or to proceed at once to the consideration of any of them. After the speech, any business connected with the orders appears to be admissible to the house, so as to prove their right to act without reference to any authority but their own, invariable by a bill a first time pro forma before they take the speech into consideration. Other business is also done very frequently at the same time. Notice may be given of a session to meet the houses in any business, and the business is not limited to matters connected with the speech. In the present session (1840) a question of privilege, arising out of the action of Stockdale against the printers, the case not determined before no notice was taken of her Majesty's speech.

Prorogation and Adjournment.—Parliament, it has been seen, can only commence its deliberations at the time appointed by the king; nor can it continue them longer than he pleases. He may prorogue it by having his command signified in his presence by the lord chancellor or speaker of the house of lords to both houses, or by writ under the great seal, or by commission. The effect of which is, which they call, all business pending until parliament may be summoned again. Not only are they sittings of parliament at an end, but all proceedings pending at the time, except impeachments by the commons, are quashed. A bill must be renewed after a prorogation, as it is not a bill new passed, but the same bill renewed. Moreover, the two houses are not to sit in the same session, a prorogation has been resorted to in other cases to enable a second bill to be brought in.

Adjournment is solely in the power of each house respectively. It has not been uncommon indeed for the king's pleasure to have been appointed, by message or by letter, that both houses should adjourn. Either of them however may decline complying with what can be considered as no more than a request. Business has frequently been transacted after the king's desire has been made known, and the question in the ordinary course.

Dissolution.—The king may also put an end to the existence of parliament by a dissolution. He is not however entirely free to define the duration of a parliament, for after seven years it ceases to exist under the stipulation contained in the third article of the Union Act. Before the Triennial Act, 6 Wm. and Mary, there was no limit to the continuance of a parliament, except the will of the king. Parliament is dissolved by proclamation, after having been prorogued, or by a letter upon which Charles I., in his speech in 1624, 'that it should be a general maxim with kings themselves only to execute pleasure, things, and of most appealing personally in matters that may seem to them disagreeable and disagreeable.'

In addition to these several powers of calling a parliament, appointing its meeting, directing the commencement of proceedings, determining them for an indefinite time by prorogation, and finally of dissolving it, the crown has the creation of one entire branch of the legislature; together with other parliamentary powers, which will hereafter be noticed in treating of the functions of the two houses.

The judicial functions of the lords and their right to pass bills affecting the peerage which the commons may not amend, are the only properties peculiar to them, apart from their personal rights and privileges.

Taxation.—The chief powers vested in the house of commons are those of raising money for the public service. Bills for these purposes can only originate in that house, and the lords may not make any alterations in them, except for the correction of clerical errors. On the opening of parliament, the king directs estimates to be laid before the same; but the amount of the expenditure is in the hands of the commons at pleasure. Grants distinct from those proposed in the estimates cannot be made without the king's recommendation being signified. The commons will not allow the right of the lords to insert in a bill any pecuniary conditions or fines to be levied on the subject, or only to relate to the punishment of offences, and the house shall determine whether it may be expedient in such particular case to insist upon the exercise of their privilege.

Right of determining elections. Another important power peculiar to the commons is that of determining all matters touching the election of their own members, and involving therein the rights of the electors. Upon the latter portion of their right a memorable contest arose between the lords and commons. The recognition of Aylesbury, brought an action at common law against the returning-officers of that town for having refused to permit him to give his vote at an election. A verdict was obtained in favor of the commons against the returning-officers, on the ground that the Aylesbury Bench, which was reversed by the house of lords upon a writ of error. The commons declared that 'the determination of the right of election of members to serve in parliament is the proper business of the house of commons of the nation, which would always be very jealous of, and particu- larly by themselves; but the rigid assertion of this rule was found to be attended with much inconvenience, and a standing order was made in 1831, directing the Speaker in each case to report whether the object of the question, the validity of the election, or the right of the returning officers or of the subject on the subject, or only to relate to the punishment of offences, and the house shall determine whether it may be expedient in such particular case to insist upon the exercise of their privilege.

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They endeavoured to obtain their discharge on writs of habeas corpus, but did not succeed. The commons declared their counsel, agents, and solicitors guilty of a breach of privilege, and committed them also. Resolutions condemning these proceedings were passed by the lords; conferences were held, and addresses presented to the queen. At length the queen came down and prorogued parliament, and thus put a stop to this, and the imprisonment of the Aylesbury men and their counsel.

The question which was agitated at that time has never since arisen. The commons have continued to exercise the sole right of determining whether electors have had the right to vote, while inquiries into the confidence of candidates for seats in parliament, and specific modes for trying the right of election by the house have been prescribed by statutes, and its determination declared to be 'final and conclusive in all subsequent elections, and to all intents and purposes, final.'

Connected with the right of the commons to adjudicate upon all matters relating to elections, may be mentioned their power over the eligibility of candidates. John Wilkes was expelled, in 1764, for being the author of a seditious libel. In the next parliament (February 3, 1769) he was again expelled for another libel; a new writ was ordered for the county of Middlesex, which he represented, and he was re-elected without a contest; upon which it was resolved by the house, on February 10th, 'that the admission of Mr. Wilkes into this house has been in this and every other case of a resolution of parliament expelled this house, he was and is incapable of being elected a member to serve in this present parliament.' The election was declared void, but Mr. Wilkes was again elected, and his election was once more declared void, and the writ issued. A third petition was tried. Mr. Luttrell, then a member, accepted the Chitterton Hundreds, and stood against Mr. Wilkes at the election, and, being defeated, petitioned the house against the return of his opponent. The house resolved that although a majority of the electors had voted for Mr. Wilkes, Mr. Luttrell ought to have been returned, and they amended the return accordingly. Against this proceeding the electors of Middlesex presented a petition, without effect, as the house declared that Mr. Luttrell was duly elected. The writ was accordingly expunged, and the elections were reversed. On the 3rd of May, 1762, the resolution of the 17th of February, 1769, was ordered to be expunged from the journals as 'subversive of the rights of the whole body of electors of this kingdom.' A resolution similar to that expunged had been passed in the case of the unfortunate Hall, in 1780, as part of the many punishments inflicted upon him, which we shall have occasion to mention.

Oaths.—The power of administering oaths exercised by the lords is not claimed by the house of commons. They found, however, it to be the law to administer oaths to ministers of the crown, only, and are not to be permitted to be administered by the administration of an oath, by resorting to the authority of justices of the peace who happened to be members of their own body; but all such expedients have been subsequently abandoned. Any person who attempts to secure oaths by false or dishonest means is punishable by the house for a breach of privilege, not being amenable to the laws regarding perjury.

Election committees have power by statute to administer oaths, and witnesses giving false evidence are guilty of perjury.

3. Privileges.—Both houses of parliament possess various rights and privileges for the maintenance of their collective authority, and for the protection, convenience, and dignity of individual members. At the commencement of every parliament the Speaker, on the motion of the commons, has 'laid claim to them of the king' since the reign of Henry VIII., but they appear to have been always enjoyed with equal certainty before that time. Some of them have been subsequently confirmed, modified, and even abolished by statute; but the privilege of the person of the Speaker remains unchanged, and prays for some which have been discharged by law since the original form was adopted.

Commitment and Fines.—The power of commitment for contempt has always been exercised by both houses. It has been repeatedly brought under the cognizance of the courts, and allowed without question. Mr. Wynn, in his 'Argument,' states that there are upwards of one thousand cases of commitment by the house of commons to be found in their Journals since 1547. Breaches of privilege committed in one session may be punished by the commonwealth in another, as in the well-known case of Murray, in 1741-2, who was imprisoned in Newgate for a libel until the end of the session, and on the next meeting of parliament was again ordered to be committed; but in 1756 he was discharged in the meanwhile. Contempt of a former parliament may also be punished. The lords may commit a person for a definite period beyond the duration of the session or parliament; but a commitment by the commons holds good only until the close of the session.

The breach of oaths, in all respects to the power of the house, may impose fines. This privilege is not exercised by the commons, although there is a case in D'Ewes's 'Journal of Queen Elizabeth,' in which Mr. Hall, a member, had incurred their displeasure, by publishing a work considered derogatory to the dignity, person, and state of the house, and prejudicial to the validity of the proceedings in making and establishing laws, 'was ordered to pay a fine to the queen of five hundred marks.' The house at the same time assumed a power not found in law to impound other copies. Mr. Hall, in his turn, the Tower, and ordered that he should remain there 'six months, and until he should make retraction of the book.' This punishment was commitment for a time certain without reference to the proceedings of the session, and, in the event of a refusal to retract the book, amounted to perpetual imprisonment. A practice still exists where parties take the nature of a fine. There are certain fees payable by persons committed to the custody of the sergeant-at-arms of the house, and the whole of the income is attached to the condition of the 'payment of the fees.' These fees are occasionally remitted under particular circumstances—in one case, on account of the poverty of the prisoner.

Freedom of Speech.—Freedom of speech in one of the privileges claimed by the Speaker on behalf of the commons, but it has long since been confirmed as the right of the house of parliament by statutes. It was acknowledged in an act in the reign of Henry VIII., by which the proceedings of the commons were referred to the House of Lords. The Speaker 'is a member, who was fined and imprisoned by that court, having proposed a bill to regulate the tenniers in Cornw. were declared illegal, and the repetition of similar encroachments upon the privilege of parliament previous to the time of Charles II. is not recorded.' It was, however, confirmed in 1679, and it was by limiting its operation to the case of Speaker that a judgment was obtained in the King's Bench against Sir John Eliot, Denizll Hollis, and Valentine, in the name of Charles I. A true interpretation of the law was subsequently established by resolutions of both houses of parliament, and by a formal reversal of this judgment by the law of lords. The most solemn recognition of the privilege contained in the Bill of Rights, which declares that 'the freedom of speech and debates and proceedings in parliament ought not to be questioned in any court or place out of parliament.'

There are however certain legal incidents to this prerogative, which is necessary to notice. The law presumes everything said in parliament is with the view to the public interest, and the protection of the rights of members. If a member should publish his speech, he is viewed as the author only, and if it contain libellous matter, he will be protected by the privilege of parliament. In 1782 there was a motion filed against Lord Abingdon for libel. He had published a speech in several newspapers at his own expense. The lordship pleaded his own cause, and contended that the law of libel was inapplicable to any public officers, and that the right to speak; but Lord Kenyon said that 'the public interest was not infringed by the publication of the speech, and he had a right to speak without being bound by any individual's restraint.' In 1793, Sir John Bowes, a member, had made a charge against an individual to the house of commons, and incorrect reports of his speech having appeared in several newspapers, Mr. Cretney wrote a correct report to an editor, requesting him to publish it in his newspaper. A jury found Mr. Cretney guilty of sedition, and the court of King's Bench refused an application for a new trial; on which occasion Lord Ellenborough said a member of that house has spoken what he thought right, and what he was at liberty to speak, in his character of a member of parliament, not having stopped there; but, unauthorized by the house, he was chosen to publish an account of that speech in which he has
Pleased to call a corrected form, and in that publication has thrown out reflections injurious to the character of an individual.

**Freedom from Arrest.**—The Speaker's petition prays on behalf of the commons, 'that their persons, their estates, and servants, may be free from arrests and all molestations. These words are not more extensive than the privileges of the commons, for forms which has been enforced may be found in nearly every page of the earlier volumes of the Journals. This privilege has however been limited by statutes, the last of which (10 Geo. III., c. 50) states in the preamble that the previous laws were for the purpose of obviate complaints arising from the delay of suits by reason of privilege of parliament, and enacts that 'any person may at any time commence and prosecute any action or suit, &c., against any peer or lord of parliament, or against any of the knights, citizens, or burgesses.' The said part of the said act has been in force, and its operation has been the legal charge of all other persons as that of any private individual. Their servants do not enjoy any privilege or immunity whatever.

The privilege of freedom from arrest has always been subject to arrests by peers of the kingdom, by reason of the security of the peace; and though in other criminal charges each house may, if it see fit, prevent the abstraction of a member from his parliamentary duties, the case of Lord Cochran, in 1813, will show how little protection the house of commons has, and how much more, though of a temporary nature, the security of the peace. The Speaker, having been indicted and convicted for a conspiracy, was committed to the King's Bench prison. He afterwards escaped, and was arrested by the marshal while sitting on the privy councilor's bench in the house of commons, on the 28th of April, when no other member present, prayers not having been read. The committee of privileges declared that by this proceeding the marshal of the King's Bench 'the privileges of parliament did not appear to have been violated so as to call for the interposition of the house; and that any person entitled to the benefit of such rule shall choose to proceed in that way.

The persons of members are still free from arrest or imprisonment in civil cases. The existing statute was made in 1765 to enable the legal charge of all other persons as that of any private individual. Their servants do not enjoy any privilege or immunity whatever.

The privilege of freedom from arrest has always been subject to arrests by peers of the kingdom, by reason of the security of the peace; and though in other criminal charges each house may, if it see fit, prevent the abstraction of a member from his parliamentary duties, the case of Lord Cochran, in 1813, will show how little protection the house of commons has, and how much more, though of a temporary nature, the security of the peace. The Speaker, having been indicted and convicted for a conspiracy, was committed to the King's Bench prison. He afterwards escaped, and was arrested by the marshal while sitting on the privy councilor's bench in the house of commons, on the 28th of April, when no other member present, prayers not having been read. The committee of privileges declared that by this proceeding the marshal of the King's Bench 'the privileges of parliament did not appear to have been violated so as to call for the interposition of the house; and that any person entitled to the benefit of such rule shall choose to proceed in that way.

Courts of justice have committed privileged persons for contempt, and parliament has refused to protect them. By a standing order of the house of lords, 8th June, 1757, it was declared 'that no peer or lord of parliament hath prior right to the printers and printers of pamphlets as is allowed by the order of the court of Westminster-hall to pay obedience to a writ of habeas corpus directed to him;' and in the case of Earl Ferrers, it was decided that an attachment may be granted if a peer refuses obedience to the writ of habeas corpus against the refusal of the act of parliament. Mr. Long Wellesley in 1831, and that of Mr. Leechman Charlton in 1837, in which members committed by the lord chancellor for contempt have laid claims to privilege, which were not admitted by the house of commons. Persons are always free from arrest; and regards the commons, their privilege is supposed to exist for 40 days after every prorogation and 40 days before the next appointed meeting.

Jurisdiction of Courts of Law in Matters of Privilege.—In conjunction with the exercise of privilege, an important point of law arises as to the jurisdiction of courts of justice. It is one of great interest and still greater doubt at the present moment, and has at various times been the occasion of much contention. The right of the house of lords to commit any of its own members, which was asserted to be the judge of its own privileges. Sir Edward Coke affirms, 'whatever matter arises concerning either house of parliament, ought to be examined, discussed, and adjudged in that house to which it relates, and not elsewhere,' that no person shall have power to decide or declare to create to themselves new privileges not warranted by the known laws and customs of parliament,' which was assented to by the commons. (14 Commons' Journals, 555, 560.) The degree of jurisdiction to be exercised by the courts and the proper mode of dealing with actions involving matters of privilege, it would indeed be difficult to determine, after the inconsistencies which have been shown in practice and the great variety of opinions expressed by learned men. No more than a concise statement of a few cases will be needed to show the difficulties in which the question is involved.

First, as to the right of courts to inquire into the existence and nature of privileges claimed by either house of parliament. Coke lays it down that 'judges ought not to give any opinion of a matter of parliament, because it is not to be decided by the common laws, but secundum leges esse consultandae in parliament; and on this ground, by parlaments have confessed.' (4 Inst., 15.) When Paty, one of the Aylesbury men, was brought before the Queen's Bench on a writ of habeas corpus, Mr. Justice Powell said 'this court may judge of privilege, but not contrary to the existence of the protection of the peers, or the judges of privilege only incidentally; for when an action is brought in this court, it must be given one way or other.' (2 Lord Raymond, 1105.) The opinions of other judges to the same effect, expressed at different times, might also be adduced, as the case of the right of the House of Commons to decide whether the debates and proceedings in parliament ought not to be impeached or questioned in any court or place out of parliament, are generally relied upon in confirmation of this view. If this were always taken of the question, little difference would be made by the practice of parliament, which would arise. The course would be simple. Whatever action might be brought would be determined in a manner agreeable to the house whose privileges were questioned; and if it should be determined against it, there would be no dissensions. But as such unanimity of opinion has not always existed, there has been a clashing of jurisdictions which nothing probably but a statute can prevent for the future.

A judgment was obtained against Sir W. Williams, the Speaker of the house of commons, in the second year of James II., for having caused a paper entitled 'Dangerfield's Narrative' to be printed by order of the house. This the house declared to be an illegal judgment, and against the freedom of the press. The case was also tried in the King's Bench, but it miscarried in three different sessions. (10 Commons' Journals, 177, 205.)

The denial of the exclusive jurisdiction claimed by the commons in 1704, in respect of the right of elections, as being above, is another important occasion in which the privilege of the commons has clashed with the judgments of legal tribunals.

The only other case which need be mentioned in this place is that of Stockdale v. Sarsard. Messrs. Sarsard, by an order of parliament, by order of the house, the Reports of the Inspectors of Prisons, in which a book published by Stockdale was described in a manner which he conceived to be libellous. He brought an action against Messrs. Sarsard during a recess, but had a resolution of parliament in which the privileges of the commons having directed Messrs. Sarsard to publish all their parliamentary reports is no justification for them, or for any bookseller who publishes a parliamentary report containing the same matter. In consequence of these proceedings, a committee was appointed, on the meeting of parliament in 1837, to examine precedents and to ascertain the law and practice of parliament in reference to the publication of papers printed by order of the house. The result of this investigation was the passing of the following resolutions by the house:

'7. That the power of publishing such of its reports, votes, and proceedings as it shall deem necessary or conducive to the public interests is an essential incident to the constitutional functions of parliament, more especially of this house as the representative portion of it.

'8. That by the law and privilege of parliament, this house has the sole and exclusive jurisdiction to determine upon the existence and extent of its privileges, and that the institution of proceedings of any action, suit, or other proceeding, for the purpose of bringing them into discussion or decision before any court or tribunal elsewhere than in par-
liament, is a high breach of privilege, and renders all parties concerned therein amenable to its just displeasure, and to the punishment consequent thereon. That for any court or tribunal to assume to decide upon matters of privilege inconsistent with the determination of either house of parliament is contrary to the law of parliament, and is a breach and contempt of the privileges of parliament.

Notwithstanding these resolutions, Stockdale immediately commenced another action. The Queen's Bench decided against the privileges of the house. A third action was then brought by Stockdale, and not being defended, judgment was given against the parties and the damages were assessed in the sheriff's court.

As yet the jurisdiction of the courts to inquire into the privileges of parliament and to give judgments inconsistent with its determination has alone been touched upon; the next, and its consequence thereto, is occasioned by the insolence of the members. This practice has been extreme and inconsistent, as a rapid view of it will show. An action had been brought against Topham, the sergeant-at-arms, for executing the orders of the house of commons in arresting certain persons, and it was pleaded to the jurisdiction of the court, but his plea was overruled, and judgment was given against him. The house declared the judgment to be a breach of privilege, and committed Sir F. C. to appear on the hustings and in the house of the sergeant-at-arms. (10 Commons Journals, 227.) In speaking of this proceeding, Lord Ellenborough expressed his surprise that a judge should have been questioned for having given a judgment which no other judge would have delivered against the commons. He could have done so from 'penalty.'

In the case of Ashby and White, so often referred to, the commons declared that whoever shall presume to commence any action, and all attorneys, solicitors, counsellors, and sergeants-at-law soliciting, prosecuting, or pleading in any matter of high breach of privilege of this house. The effect of this resolution, if obeyed, would be to prevent the courts from coming to any decision at all upon matters of privilege, as an action would be stopped at its commencement; but the principle has not been adhered to. When the act of marcher brought actions against the Speaker and the sergeant-at-arms, in 1810, for taking him to the Tower in obedience to the orders of the house of commons, they were directed to plead, and the attorney-general received instructions to defend them. A committee at the same time reported a resolution that the bringing such actions for acts done in obedience to the orders of the house is a breach of privilege, but it was not adopted by the house. The actions proceeded in the regular course, and the court of King's Bench sustained and vindicated the authority of the house.

It has been already said that Stockdale's first action was brought when parliament was not sitting. Having no specific directions therefore from the house, Messrs. Hansard pleaded in abatement. On the general principles they proved the rights of the house, which were held to be no more than a particular resolution, but had judgment upon a plea which would have availed them equally had they printed the report complained of on their own account. Notwithstanding its resolutions, the house, on being acquainted with this action, instead of acting upon them when a second was committed, reverted to the precedent of 1810, and directed Messrs. Hansard to plead, and the attorney-general to defend them. In this case nothing but the privileges of the house of commons were attacked. Under the special circumstance of the case, it was held that the court of King's Bench unani mously decided against them. Still the house of commons was reluctant to act upon its own resolutions, and instead of punishing the plaintiff and his legal advisers, 'under the special circumstances of the case,' it ordered Hansard to be paid.

The resolutions however were not rescinded, and it was then determined that in case of future actions, Messrs. Hansard should not plead at all; and that the parties should suffer for their contempt of the resolutions and authority of the house. Another action was brought by the same person and for the same publication. Messrs. Hansard did not plead, the judgment went against them by default, and the damages were assessed by a jury in the sheriff's court at £600. The sheriffs of Middlesex levied for that amount, but having been served with copies of the resolutions of the house, they were anxious not to pay the money to Stockdale until they were unable to delay the payment any longer. At the opening of the session of parliament in 1840, the money was still in their hands. The case of Stockdale is at once one of those which has been carried on in spite of its resolutions, and in the first place committed Stockdale to the custody of the sergeant-at-arms. The sheriffs were ordered to refund the money, and, on their refusal, were committed to Newgate for the offence; and Messrs. Hansard were again ordered not to plead. Once more judgment was entered up against them, and a writ of inquiry of damages issued.

Mr. France, the under-sheriff, upon whose execution of the orders of the house of commons was ordered, happening to be solicitor for the defendants, informed Mr. Howard, the solicitor for Mr. Stockdale, that he was suffered to escape with a reprimand. The sheriffs retained possession of the money until an attachment was issued from the Queen's Bench, when they paid it over to Stockdale. Stockdale, while in prison, commenced a fourth action to recover his damages. This action was ordered to be tried before Mr. Howard, the solicitor for Mr. Stockdale, and the case was remitted to the common prayers of the commons, expressed by petition his anxiety to pay ob edience to them, and sought the protection of the house. He then obtained leave to show cause before the court of Queen's Bench on the fourth day of Easter, in which he asked that the common prayers, to be printed by order of either house of parliament, are to be stayed by the courts, upon delivery of a certificate and affidavit to the effect that such publication is by order of parliament. This bill passed the commons, and was sent up to the lords, by whom it was read with certain amendments, to which the commons agreed. In executing the Speaker's warrant for taking Mr. Howard into custody, the messengers had remained some time in his house, for which he brought an action of trespass against them. As witness for the plaintiff, Mr. Howard brought evidence of the weight of the house of commons, and as the right of the house to commit was not directly brought into question, the defendants were, in the case, instructed to plead; although a clause for staying further proceedings in the action was contained in the bill which was pending at that time, in the house of lords; by whom however it was afterwards omitted.

Forms of Procedure.

Mr. Speaker: Preliminary Proceedings.—On the meeting of a new parliament it is the practice for the lord chancellor, with other peers appointed by commission under the great seal for that purpose, to open the parliament by stating 'that her Majesty will, as soon as the members of both houses shall have assembled in her presence and in that of her parliament, and be in the usual number,' and 'that it is necessary for the Speaker of the house of commons, as the first business, that you, gentlemen of the house of commons, repair to the place where you are to sit, and there proceed to the appointment of some proper person to be your Speaker; and that you present such person whom you shall choose here, to-morrow (at an hour stated) for her Majesty's royal approbation.' The commons then proceed at once to the election of their Speaker. If any debate arises, the clerk at the table reads the order for the election of the Speaker, and it is put and settled. If the Speaker be only elected by the house, the Speaker takes his seat, and the House is then ready to proceed. If he be chosen, his proposer and seconder conduct him to the chair, where, standing on the upper step, he thanks the house and takes his seat. It is usual for some members to congratulate the Speaker, and to present him with various presents, and to ask him when he is to be paid. As yet his election is only Speaker elect, and as such presents himself on the following day, in the house of lords, and acquaints the lords commissioners that the choice of the commons has 'fallen upon him,' that he feels the difficulties of his high and arduous office, and that, if he should have the pleasure to disapprove of this choice, her majesty's faithful commons will at once select some other member of the house better qualified to fill the station than himself. It is stated by Halsall, that there have been only two instances in which neither this form, of having the royal prorogation of the session, nor the other, of the king's approbation of the person elected, have been observed. —
The first in the election of Sir Harbottle Grimston, on the 25th of April, 1666, to be Speaker of the Convention Parliament which met in the Restoration; the other, in the election of Mr. Powle, 22nd January, 1668-9, in the Convention Parliament at the Revolution.  The only instance of the royal approbation being refused is in the case of Sir Edward Seymour in 1676. Sir John Topham indeed was chosen by the Commons and the trial was conducted by the king, and another was chosen by the commons in his place.  In order to avoid a similar proceeding on the part of the king, Sir Edward Seymour, who knew that it had been determined to accept his excuse, omitted the usual form.

The Speaker has then approved his Majesty’s claim on behalf of the commons, 'by humble petition, to all their antient and undisputed rights and privileges,' which being confirmed, the Speaker with the commons retires from the bar of the house of lords.

Bill of Rights.

With houses of commons and the oaths required by law. In the commons the Speaker takes them before any other member. Three or four days are usually occupied in this duty before the queen declares to both houses, in person or by commission, the reasons of calling the parliaments.

Conduct of Business, Divisions, &c.—In the house of lords business may proceed when three peers are present, but, in the house of commons, the business is adjourned until at least six members are present. If that number be not present at five o’clock in the afternoon, the latter at four.

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The Speaker adjourns the house until the next sitting day. In both houses all questions are decided by a majority, but in the lords proxies are counted, while in the commons none may vote but those present in the house when the question is put by the Speaker or chairman. When any question arises upon which a difference of opinion is expressed, it becomes necessary to take a vote. In the house of lords, the party in favour of the question is called ‘content,’ and that opposed to it, ‘not-content.’ In the commons these parties are described as the ‘ayes’ and ‘noes.’ When the Speaker cannot decide by the voices which party has the majority, or when his decision is disputed, a division takes place. This is effected in the lords by sending the ‘contentis’ or ‘non-contentis,’ as the case may be, to the other side of the bar, and leaving one party in the house. Each party is thus counted separately. The practice in the other house, until 1832, was the same; but since then both houses have been retained in the house. Two tellers for each party then counted the numbers, and reported them. In 1836 it was thought advisable to adopt some mode of recording the names of members who voted, and for this purpose several contrivances were adopted. The mode adopted is this. There are two lobbies, one at each end of the house; on a division the house is entirely cleared, one party being sent to each of the lobbies. Two clerks are stationed at each of the entrances to the house, holding lists of the members in alphabetical order, which have been prepared for the purpose of the division, and the clerks compare the names in their order; and the division lists are then delivered on the following morning together with the votes and proceedings of the house. This plan has been quite successful; the names are taken in the same order as the list and accuracy, and that only by individuals who have been chosen by the process.

In committees of the whole house, divisions are taken by the members of each party crossing over to the opposite side of the house, unless five members require that the houses shall be equally divided in the usual manner.

In addition to the power of expressing assent or dissent by a vote, peers may record their opinion and the grounds of it by a protest, which is entered in the Journals, together with the names of all the peers who concur in it. When bills of great interest are to be debated in the upper house, the lords are summoned; and in the house of commons an order is occasionally made that the house be called over, and members not attending when their names are called, are reported as defaulters, and ordered to attend on another day, when, if they are still absent, and no excuse be offered, they are sometimes committed to the custody of the serjeant-at-arms.

The bills which occupy nearly the whole attention of both houses (if we except the hearing of appeals of which the highest court is the House of Lords) are the passing of bills; and the mode of proceeding with respect to them may be briefly described in the first place.

Bills, Public and Private.

Bills are divided into two classes—such as are of a public nature affecting the general interests of the state, and such as relate only to local or private matters. The former are introduced directly by the motions of members; the latter are brought in upon petitions from the parties interested, or for the necessary notices have been given and all fees required by the standing orders have been complied with.

With few exceptions, public bills may originate in either house, unless they be for granting supplies of any kind, or involve directly or indirectly the lending or appropriation of any tax or fine, and then the business is referred to the Commons. The exclusive right of the Commons to deal with all legislation of this nature affects very extensively the practice of introducing private bills into either house. Thus, all those which authorize the transfer of local lands or buildings are transferred to the lower house. These compose by far the greater part of all private bills. All measures of local improvement, whether for enclosing lands, lighting, watching, and improving towns, establishing police, or making roads, bridges, etc., are public works, and are introduced in the Commons. On the other hand, many bills of a personal nature are always sent down from the lords, such as bills affecting private estates, for dissolving marriages, and for the naturalization of aliens. As a question of principle it is an established practice that so large a proportion of bills must begin in one house, but much obstruction to business and a very unequal division of labour are the results of the practice. Bills affecting the peerage must originate in the lords, and acts of grace with the crown, where the prerogative is exercized.

Progress of Bills: Public Bills.—Motions for leave to bring in a bill of a public nature are not very frequently refused. The more usual time for opposing any measure in its progress is on the second reading. The number of amendments, towards the end of the debates, is usually fixed for the second reading, which generally leaves a sufficient interval for the printing and circulation of the bill.

It has been already said that the second reading is the occasion on which the bill is more particularly canvassed. Its principle is at that time made the subject of discussion, and if it meet with approval, the bill is committed, either to a committee of the whole house or to a select committee, to consider its several provisions in detail. A committee of the whole house is in fact the house itself, in the absence of the Speaker from the chair; but the rule which allows members to speak as often as they think fit, instead of restricting them to a single speech, as at other times, affords great facilities for the careful examination and full discussion of the details of a bill. All bills of an intricate and technical description to select committees has become very prevalent of late years, and might be extended with advantage. Many bills are understood by a few members only, whose observations are listened to, and their views and language are often withheld in the house, which in a committee might be embodied in the bill. By leaving such bills to a select committee, the house is enabled to attend to measures more generally interesting, while other business, of perhaps equal importance, is provided for at the same time; and it has always the opportunity of revising amendments introduced by the committee.

Before a bill goes into committee there are certain blanks for dates, amount of penalties, &c., which are filled up in the course of the debates. Other provisions are expressed in words, pass twice, and even in some instances three or four times through the committee. When the proceedings in committee are terminated, the bill is reported
to the amendments to the house, on which occasion they are agreed to, amended, or disagreed to, as the case may be. If any amendments have been made, it is a common and very useful practice to reprint the bill before the report is taken into consideration. After the report has been agreed to, the bill with the amendments ordered to be printed previous to the third reading. A proposition was made not long since, but without success, for discontinuing the custom of engrossment upon parchment, and for using an examined copy of the printed bill, signed by the clerk of the house, for all the purposes for which the engrossed copy is now required.

The third reading is a stage of great importance on which the entire measure is reviewed, and the house determines whether, after the amendments that have been made on previous reading, the bill is consistent with the constitution and with the law. The question, 'that this bill do pass,' which immediately succeeds the third reading, is usually no more than a form, but there have been occasions on which that question has been opposed, and even negatived. The title of the bill is not material.

An interval of some days usually elapses between each of the principal stages of a bill; but when there is any particular cause for haste, and there is no opposition, these delays are dispensed with, and the bill is allowed to pass through the minor stages, and occasionally through all, on the same day.

This statement of the progress of bills applies equally to both houses of parliament. There is however a slight distinction in the case of a bill while on the table which is always 'intituled an act,' whether it has originated in the lords or has been brought up from the commons.

When the commons have passed a bill, they send it to the lords by one of their own members, who is usually accompanied by others. The lords send the bill by two masters in chancery; unless they relate to the crown or the royal family, in which case they are generally sent by two judges.

Private Bills.—In deliberating upon private bills parliament have to be considered as acting judicially. The conflicting interests of private parties, the rights of individuals, and the protection of the public have to be reconciled. Care must be taken, in furthering an apparently useful object, that injurious be not done to individuals, although the public may be advantaged by it. Vigilance and caution should be exercised lest parties professing to have the public interest in view should be establishing, under the protection of a statute, an injurious monopoly. The rights of landowners amongst themselves, and of the poor, must be scrupulously considered. Even where the public interest is affected by the making of a railway. Land, houses, parks, and pleasure grounds are sacrificed to the superior claim of public utility over private rights. The repugnance of some proprietors to permit the line to approach their estates is often a serious obstacle. The question of compensation is always a difficult one. The selection of a line and of stations, the award of contracts, the employment of the labourers, the supervision of its execution, are all matters which belong peculiarly to the department of the government. In short, the selection of a railway line is a matter of state policy, and the determinations of the department have generally the sanction and approval of the house of commons.

The progress of bills depends on the expediency and importance of the measures themselves. The public interest is not always sufficiently considered, and in many cases gentlemen are evidently of opinion that they have been neglected. The progress of a bill depends also on the skill and ability of the gentlemen who manage its progress through the house, and the support which they have obtained from their friends. In short, it is necessary that bills should have a strong backer in the house, if they are to have a fair chance of success. Bills are not considered as having a strong backer unless they have the support of the majority of the house.

The committee on the standing orders is more likely to be maintained by one committee than by several; and partiality in any one case is scarcely conceivable in a body which has to deliberate upon such important questions. The committee which presides over the house is simply whether the standing orders have been complied with or not. If it be favourable, leave is at once given to bring in the bill; if not, it is referred to another committee for the purpose of considering the beginning of a new committee on standing orders, whose province it is to inquire into the circumstances of the case, and report their opinion as to the propriety of dispensing with the standing orders, of requiring notices, or imposing new conditions. If this committee decide that the parties are not entitled to indulgence, it is still competent for the house to relax its standing orders, as it does not by any means delegate its authority; yet in practice the report is final. Attempts are sometimes made to overrule it, but never, we believe, with success.

When nothing has occurred to obstruct the progress of the bill, it is read a first time; after which seven clear days must elapse before the second reading, the bill being printed and delivered to members in the interval. The principle is now considered by the house to be a matter of public policy, and if the question for reading the bill be carried, it is then committed to a select committee. The constitution of committees on petitions has already been explained. While the list committees were resorted to, both the petition and the applicant had to be present. As the petition was not necessarily sent a new mode of appointing committees is in operation. It has been tried for a short time only, and must be tested by further experience before any decided opinion can be given upon its merits. The lists which have already been described as the lists of 1825, under which the selection of a new committee, when the selection is appointed, to whom members upon the list must signify their intention to attend throughout the whole proceedings before they are permitted to vote. The committee of selection have power also to add to the Speaker's list any member who is interested in the bill, provided they be satisfied as to the reality of such interest. They then add a certain number of other members not locally interested, in such a proportion as they may determine, and may continue for a further period.

In committee, the bill, if opposed, undergoes a severe examination. Petitions against it are presented to the house and referred to the committee, to hear counsel and examine witnesses. The principle of the bill has been by most members of the house considered to have been adopted as an argument for the bill, but not opposed to any other committee, as it allows them to decide against a principle in favour of which it has already declared an opinion; however it has sometimes interfered in a manner which will be best explained by briefs detailing the case. In 1827 the committee on the Durham (South-West) Railway Bill reported, according to the usual form, that the preamble had not been proved to their satisfaction, upon which they were ordered to reassemble for the purpose of reporting specially the preamble, and the evidence
and reasons in detail on which they had come to their resolution. The detailed report was accordingly made, but the decision of the committee was not further questioned. In 1837 the bills for making four distinct lines of railway to Brighton had been referred to one committee. An unprecedented contest arose between the promoters of the competing lines, and it was apprehended that all the bills would be lost by the combination of three of the railways against each of the lines on which the committee would have to determine separately. This consequence was prevented by an instruction to the committee 'to make a special report on the respective merits of each of the lines to enable the house to determine which to send back for the purpose of having the landowners heard and the clauses settled.'

If the committee allow that the allegations of the preamble to the bills proceed they proceed to consider the clauses clause by clause. But before we quit the subject of the preamble, the modern practice concerning railway bills may be adverted to. There are so many grounds upon which the preamble may fail to be proved, and so many points on which the committee should be informed before a just decision can be given, that in 1836 a rule was established which obliges the committee to report in detail. On receiving the report, the house is now acquainted with the chief particulars from which the expediency of the measure may be deduced; the cost of the whole work, the expense of the works, and the sufficiency of the estimates,—the revenue expected from passengers and from agricultural produce or merchandise, with the grounds of the calculation,—the engineering difficulties,—the gradients and curves, are all made and placed before the house. An advantage, with great advantage, to other classes of bills; but is confined at present to railway bills alone. Much attention has been paid of late to the improvement of the modes of conducting private business, and it is not improbable that detailed regulations of the future recommendations of committees, on whom the task of suggesting further improvements may be imposed.

By a standing order, 13th December, 1831, parties complaining of any vote of a committee on a private bill are at liberty to vote against that particular vote, on entering into a bond with two sureties for payment of costs. A committee of seven may then be appointed, by ballot, out of 200 members who are chosen at the beginning of the session as 'the committee of appeal.' This power of objection to the votes of a committee however is very rarely resorted to, and appears to be little more than nominal. There have been shown by the house some reluctance to permit any effectual appeal, and a desire to limit the application of the standing order.

It has been said that public bills are occasionally referred to select committees; these however must also pass through a committee of the whole house. Private bills are committed to select committees only. Bills for divorces, by a standing order, are referred to the common committee of the whole house, until the 11th February, 1840, when an order was made for referring them to a select committee of nine members.

It will not be necessary to pursue any further the progress of private bills, which differs only from that already described in respect of bills of a public nature, in the necessity for certain specified intervals between each stage, and for notices in the private bill office.

In the house of lords, when a private bill is unopposed, it is the custom for the chairman of the committee and any other peers may attend; but when a bill is to be opposed, the committee on standing orders inquires whether the standing orders have been complied with, and if so, the bill is referred to a committee of five appointed by a standing order, the chairman of whom is to assume the duty of selecting all committees on opposed bills, according to the circumstances of each case.

In order to ensure a proper acquaintance with the provisions of private bills, some of which are very voluminous, the house of commons has lately adopted a rule requiring breviate bills to be laid before them six days before the second reading, and breviate of the amendments made by the committee, before the house take the report into consideration.

Conferences between the Two Houses.—The progress of bills in each house of parliament having been detailed, it still remains to describe the subsequent proceedings in case of difference between them. When a bill has been returned by either house to the other, with amendments which are disagreed to, a conference is desired by the house which disagrees to the amendment, to acquaint the other with the reasons for such disagreement; in order, to use the words of Hatsell, 'that after considering those reasons, the house may be induced, either not to insist upon their amendments, or may insist thereon, as it may think just; or, if the other house having made them, as may prevail upon the other house to agree to them. If the house which amend the bill are not satisfied and convinced by the reasons urged for disagreeing to the amendments, but persevere in insisting upon their amendments, the other house, desiring to decide at which of the houses at which, in their turn, they state their arguments in favour of the amendments, and the reasons why they cannot depart from them; and if after such second conference the other house resists and insists upon disagreeing to the amendments, they ought then to demand of the 'free conference,' at which the arguments on both sides may be more amply and freely discussed. If this measure should prove ineffectual, and if, after several free conferences, neither house can be induced to depart from the point they originally insisted upon, nothing further can be done, and the bill lost. An interesting occasion on which all these proceedings were successively adopted has recently occurred; a free conference had not been held since 1702, and yet a controversy in 1836 upon amendments made to a large bill to a bill for amending the Act for regulating Municipal Corporations.

Whether the conference be desired by the lords or by the commons, the former have the sole right of appointing the time and place of the conference. The house of commons must clearly express in their message the subject upon which it is desired, and it is not granted as a matter of course. There are many instances to be found in the Journals in which a conference has been refused, but not of late years. The reasons that are to be offered to the other house are prepared by a committee appointed for that purpose, who report them for the approval of the house. These reasons are generally very short, but in some cases arguments have been entered into at considerable length. The conference is conducted by 'Managers,' who are appointed by the house that desires the conference, and who, on the part of the house desiring the conference, are the members of the committee who have drawn up the reasons, to whom others are occasionally added. Their duty is to read and deliver in the reasons with which they are entrusted to the managers of the other house, who report them to the house which they represent. At a free conference the managers on either side have more discretion vested in them, and may urge whatever arguments they think fit. A day is appointed for the first free conference, to which we have just alluded, and the business of the managers was taken in short-hand and printed. While the conference is being held, the business of both houses is suspended until the return of the managers.

The reports of bills by one house are not the only occasions upon which conferences are demanded. Resolutions of importance, in which the concurrence of the other house is desired, are communicated in this manner. Reports of committees have also been communicated by means of a conference. In 1829 a conference was demanded by the commons to request an explanation of the circumstances under which a bill that had been amended by the lords had received the royal assent without being returned to the commons for their concurrence. The lords expressed their regret at the refusal and rejected the bill. In 1834 this conference was again demanded by the commons, when the house had themselves been prepared to desire a conference upon the subject, when they received the message from the commons.

Conferences were formerly held in the Painted Chamber, but since the destruction of the houses of parliament by fire in 1834, this is not the case. The managers of both sides sit in the assembly of the two houses of the house of peers, and conferences now meet in one of the lords' committee rooms.

Royal Assent to Bills.—When a bill has passed both houses, it remains in the house of lords in the form of assent is given, unless it be a bill of supply, in which case it is returned to the commons. The royal assent may be signed by the king either in person or by commission. Several bills are usually allowed to accumulate before the royal assent is given. If they are to be signed by commission, it is done by the queen's commissioners, who are generated under the great seal for that purpose. Three of the lords commissioners, seated on a form between the throne and the woolsack in the house of
lords, command their usher of the black rod to signify to the commons that their attendance is desired, upon which the commons with the Speaker come to the bar. The titles of the bills being then read, the royal assent to each is signified by the clerk of the parliament in Norman French. For a public bill the form of expression is ‘*Le roy le veult,*’ for a private bill, ‘*Soit fait comme il est desiré,*’ under a penalty, written ‘*Soit droit fait comme il est désiré.*’ [*Petition of Right.*] A bill of supply is carried up and presented by the Speaker, and the assent is pronounced in the words ‘*Le roy redemys ses bons sujets, accepte leur benediction, et ainsi fait,*’ without any act of the royal assent before it is agreed to by the two houses, the clerk says, ‘*Les présents, seigniors, et communs en ce present parlement assemblées, au nom de leurs autres subjets remettent tres humblement votre majeste leur donne bon accord et sagesse.*’ The form of words used to express a denial of the royal assent was ‘*Le roy s’avise.*’ The last occasion in which this power was exercised was in 1707, when Queen Anne refused her assent to a bill for settling the militia in Scotland.

The royal assent is rarely given in person, except at the close of a session, when the king attends to prorogue the parliament, and then he signifies his assent to such bills as may have passed since the last commission was issued: but bills of supply are an exception for the honor and dignity of the crown, such as the bills for settling the Civil Lists, have generally been assented to by the king in person immediately after they have passed both houses.

During the Commonwealth the lord protector consented to assent in writing, on the form of the old form of words was reverted to, and only one attempt has been made to abolish it. In 1706 the lords passed a bill for abolishing the use of the French tongue in all proceedings in Parliament and courts of justice. This bill dropped in the house of commons, but was re-assessed in 1711; and when it was conducting its proceedings in courts of justice in English, but no alteration was made in the old forms still in use in parliament.

**Committees.**—Committees are either of the whole house or ‘select.’ The former are in fact the house itself, with a presiding instead of the lord chancellor or Speaker presiding. There is a more free and unlimited power of debate when the house is in committee, as members may speak any number of times upon the same question, from which they are restrained on other occasions. Select committees are specially appointed, generally for inquiring into particular subjects connected with legislation. It is usual to give them the ‘power to send for persons, papers, and records;’ but in case of any disobedience to their orders, they have no direct means of compelling compliance, but must refer the circumstance to the house which will immediately interfere.

In case of an equality of voices, the chairman, who is chosen by the committee out of its own members, gives the casting vote. Some misconception appears to have existed as to the power of the chairman in case of a tie, but it is now understood that the committee, which was however confined to them, and only existed under the provisions of acts of parliament.

In 1837, some regulations were made by the house of commons for rendering select committees more efficient and responsible, by raising the number of members from a minimum limited to fifteen. Lists of their names are to be affixed in some conspicuous place in the committee-club’s office and the lobby. Members moving for the committee are to ascertain whether the gentlemen they propose to name will attend. To every question asked of a witness, the name of the member who asks it is prefixed in the minutes of evidence laid before the house; and the names of the members present at each sitting; and, in the event of any disagreement as to the questions proposed, the name of the proposer, and the name of each member, are entered on the minutes and reported to the house. [*Committees.*]

It is not intended to touch upon the elective franchise, or upon the proceedings at elections; but the mode of trying election petitions will require a notice in this place. In 1770, controverted elections were tried and determined by the whole house of commons, as mere party questions, upon which the strength of contending factions might be tested. In 1741, Sir Robert Walpole, after repeated attacks upon his government, wrote him a letter, which became public, with the subjoined portion: ‘Sir, I have made some inquiries as to the whole state of our present election petition. ‘*Instead of trusting to the mass of their respective causes,*’ says Mr. Grenville, in proposing to measure which has since borne his name, ‘the principal definitions and principles on which the petitioners is their private interest among us, and it is scandalous by notorious fact; and if it can be proved that any persons have made use of improper or illegal means to influence the return of members, and that members of this house, who are ultimately to judge in a kind of judicial capacity between the competitors, exist themselves as parties in the contention, and take upon themselves the partial management of the very business upon which they should determine in a judicial character.’

The principle of the Grenville Act, and of others which were passed at different times since 1770, was to select committees for the trial of election petitions by lot. By the last of these (9 Geo. IV., cap. 22), thirty-three names were balloted for in each case, and the two succeeding in order who were invited to the election was entitled to strike off eleven names, and thus reduce the number of the committee to eleven. Whenever a party attended on the day appointed for a ballot in the greatest force, was likely to have a preponderance in the choice of members. The whole had no alternative but to operate as a sufficient check to party spirit in the appointment of election committees. Partiality or incompetence was very generally complained of in the decisions of committees appointed in this manner, and in 1839 an act passed for the trial of election petitions by a committee of six members, to any or all of whom the house may object, in which case the Speaker is bound to appoint others. If by irreconcilable disagreement of opinion, or by the continued absence of more than two members, the committee, when appointed, should be unable to proceed in the discharge of its duties, or if the house should determine that it shall be dissolved, its functions are to cease. To this general committee all election petitions are referred. The names of the house are put into an alphabetical list and called until a certain number is allowed to be made; but all who do not then excuse themselves from serving are bound to act as members of election committees when hereafter chosen. This list is taken by the general committee at the time of the ballot, and eight, ten, or twelve members, who, on signing their willingness to serve, are formed into ‘the chairman’s panel.’ The list is then divided into five panels by the general committee, exclusive of the chairman, the order of which is decided by lot, and a number attached to each in the order in which it is drawn. These panels are to be corrected from time to time by the general committee, according to circumstances.

The general committee gives three weeks’ notice to the parties before it proceeds to appoint a committee for the trial of election petitions. At the beginning of a session the Speaker appoints a general committee of six members, for the purpose of selecting committees, from the panel standing first in order of service, six members, whose names are read to the parties, who have power to object to any of them on grounds of disqualification specified in the act. When the six members are agreed upon, the chairman of the committee to which the panels is to be adjourned is selected. The chairman is supposed to be a body to act as chairman, who is added accordingly by the general committee. The committee, when thus constituted, is sworn, and proceeds to business. If it be reduced to less than six by the non-attendance of members, except it has already sat fourteen days or more, it is dissolved. It may sit with four members only, if it has met for twenty-five days, and with any number, without reference to the time during which it has met, provided all the parties give their consent. Petitions and questions are decided by a majority, and in case of an equality of voices the Speaker gives a second or casting vote.

*As witnesses giving*
The house and election committees are final, and are immediately carried into effect by the house. If an election be reported void, a new writ is issued; if it be decided that a member has not been duly elected and that another candidate should have been returned, the deputy clerk of the crown and the queen sign the return, after which the new member is sworn, and takes his seat; and if a petition or the opposition to it be held by the committee to have been frivolous or vexatious, the petitioner or sitting member, as the case may be, is liable to payment of all the costs.

The last proceeding in parliament which we shall describe is that of Impeachment. Impeachment by the commons is a proceeding of great importance; it requires the exercise of the highest judicial power by parliament, and therefore is one of its powers in modern times it has rarely been resorted to, in former periods of our history it was of frequent occurrence. The earliest instance of impeachment by the commons was that of Edward III. (1376). Before that time the lords appear to have tried both peers and commoners for great public offences, but not upon complaints addressed to them by the commons. During the next four reigns, cases of royal imprecations were, it seems, committed in the reigns of Edward IV, Henry VII, Henry VIII, Edward VI, Queen Mary, or Queen Elizabeth. The institution 'had fallen into disuse,' says Mr. Hallam, 'partly from the loss of that control which the commons had obtained under Richard II and the Lancastrian kings, and partly from the preference the Tudor princes had given to bills of attainder or of pains and penalties, when they wished to turn the arm of parliament against an obnoxious subject.'

Prosecutions also in the Star-chamber during that time were established for the punishment of treason, and of state offenders. In the reign of James I., the practice of impeachment was revived, and was used with great energy by the commons, both as an instrument of popular power and for the furtherance of public justice. Between the year 1620, when Sir George More was impeached, and through the years of Bacon, and the Revolution in 1688, there were about 40 cases of impeachment. In the reigns of William III., Anne, and George I. there were 15, and in George II. only one (that of Lord Lovat, in 1746, for high treason). The acts of impeachment of Warren Hastings, in 1788, and Lord Melville, in 1805, are well known.

An outline of the forms observed in the conduct of impeachments may be briefly given. A member of the house of commons charges the accused of certain high crimes and misdemeanours against the sovereign. The house agree to it, the member is ordered to go to the lords, and at their bar, in the name of the house of commons and of all the commons of the United Kingdom, to impeach the accused. A committee is then drawn up articles of impeachment, which are reported to the house, and having been discussed and agreed upon, are engrossed and delivered to the lords. Further articles may be delivered from time to time. In the case of Warren Hastings the articles of impeachment were 13, and they were read at the bar of the house of lords. The accusers send answers to each article, which are communicated to the commons by the lords; to these, replications are returned if necessary. After these preliminaries, the lords appoint a day for the trial of the impeachment. The house of Edward Hastings were 30 to 40. The house of commons in matters required to prove their charges and appoint managers to conduct the proceedings. Westminster Hall has been usually fitted up as the court, which is presided over by the lord high steward. The commons attend with the mace in their hand, and the crown remains in the custody of the usher of the black rod, to whom he is delivered, if a commoner, by the sergeant-at-arms attending the house of commons. The managers should confine themselves to charges contained in the articles of impeachment. When matters have been introduced which had not been originally laid to his charge, and the house resolved that certain words ought not to have been spoken by Mr. Burke. Persons impeached of high treason are tried by statute 20 Geo. II., c. 30, to make their full defence by counsel, a privilege which is not denied to persons charged with high crimes and misdemeanours.

When the managers have made their charges and adduced evidence of their allegations, the accused may answer them, and the managers have a right to reply. The lords then proceed to judgment in this manner:—The lord high steward puts to each peer, beginning with the junior baron, the question upon the first article, whether the accused be guilty of the charge alleged therein. He then proceeds in succession rise in their places when the question is put, and standing uncovered, and laying their right hands upon their breast, answer 'guilty,' or 'not guilty,' as the case may be, 'upon my honour.' Each article is proceeded with separately in the same manner, the lords having given their opinion last. The numbers are then cast up, and being ascertained, are declared by the lord high steward to the lords, and the accused is acquitted with the result. (Coke's Fourth Institute, cap. i; The Sovereign Power of Parliament, by W. Pryme, 1645; Parliamentary Writs, by W. Pryme, in four parts, 1659-1664; Privileges of the Barony of England when they sit in Parliament, by John Selden, 12mo, 1642; Modus tenendi Parliamentum, by C. Basset, 12mo, 1668; Rules of Order, by A. F., Eng., 12mo, 1699; Constitution of Parlaments, England, Reduced from the time of King Edward the Second, by Sir John Pettus, 1680; Original Institution, Power, and Jurisdiction of Parliament, by Sir M. Hale, 1707; republished 1776; The History of the High Court of Parliament, by Will. Hargrave, 12mo, 1674; Constitutions and Customs of the Commons of England, by William Petyt, 1660; Parliamentary and Political Tracts, written by Sir Robert Atkins, 2nd edit., 1741; History of the High Court of Parliament, by T. Gudon, 1731; Manner of Holding Parliaments in England, by Henry Howard, 1616; The History of the Commons of England, by Roger Acherley, 1731; Blackstone's Comm., book 1st; D'Wye's Journal; Lords' Journals; Commons' Journals; General Indexes and Calendars to Lords' Journals, 1569-1819; General Indexes to Commons' Journals, 1547-1817; Trial of the Vicar of Wakefield, 8vo, 1768; by order of the House of Lords, fol., 1806; State Trials; Parliamentary History; Wynne's Argument upon the Jurisdiction of the Commons to commit, 1810; Hallet's Precedents, new edit., 1819.)

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original Irish peerages, after maintaining for centuries an independence as complete as that of the native chieftains themselves, were induced to give their attendance in the house of lords, and many new peerages were conferred, some on Englishmen, or persons of English descent, some on the heads of the old Irish families. The twelve antient counties were all revalidated in the reign of Henry VIII., and others were added by Mary, Elizabeth, and James, till, in the time of the last-mentioned king, the whole island was divided into thirty-two counties: the representation, therefore, was to be returned to the representative of the lord-lieutenant and privy-council, who, upon such parliamentary intimation, or otherwise upon the application of private persons, receive and transmit such heads, or reject them without any transmis- sion of the English House of Commons for leave to bring in a bill, a motion necessary in all cases to be assented to or carried in the affirmative before the actual bringing in of any bill. And as for the consent of the crown or the government, which it is necessary and necessary to validate any bill or any act of the English parliament could take up the consideration of any proposed law, with a view to its enactment, that would in practice probably be found to operate much in the same way with the assent of the crown, which even in England is not necessary. The only thing necessary, and that is the validity, is the assent of the crown of both houses. In the Irish as well as in the English parliament there was in fact an opportunity of discussing the proposal without the permission of the crown. An Eng- lish bill in Irish bill required the consent of the crown before it would become law. An Irish bill was scarcely been sufficiently attended to in comparing the circumstances of the two legislatures. The practice of presenting heads of bills however was not introduced into the English parliament till the time of the revolution. In the reign of Charles II., according to Lord Mountmorres, 'the council framed bills altogether; a negative alone on them and their several proviso was left to parliament; only a general proposition for a bill, by way of address to the lord-lieutenant and privy council, was necessary.' In the reign of Henry VII., it was allowed that those only were binding upon Ireland in which that country was specially named or included under general words.

But the above-mentioned was only one of Poyning's laws. Others provided, as their substance is given by Blackstone (1 Com. 102): 'That before any (Irish) parliament be summoned or holden, the chief governor and council of Ireland shall certify to the king, under the great seal of Ireland, the considerations and causes thereof, and the articles of the acts to be passed therein. That after the king, in his council of England, shall have considered, approved, or altered the said acts, or any of them, and certified them back under the great seal of England, and shall have given licence to summon and hold a parliament, then the same shall be summoned and held, and therein the said acts so certified, and no other, shall be proposed, received, or rejected.' It was found however, in the course of time, that many inconveniences were occasioned by these severely restrictive regulations, which prevented any amendment of the constitution proposed, or drawn up before the parliament which should pass there in being; and therefore, by the 3 & 4 Ph. and M., c. 4, it was provided that any new propositions might be certified to England for approval, even after the summons and during the session of parliament. Still it was a demonstration of Ireland nothing more than merely the power of rejecting any law proposed to it; it could neither initiate a new law nor repeal an old one, nor even amend or alter that which was offered for its acceptance. In practice however the letter of the statute was somewhat relaxed. Blackstone goes on to state that the practice in his day (some years after the middle of the last century) was, 'that bills are often framed in either house, under the denominations of heads for a bill,' and that such heads are offered to the consideration of the lord-lieutenant and privy-council, who, upon such parliamentary intimation, or otherwise upon the application of private persons, receive and transmit such heads, or reject them without any transmission of the English House of Commons for leave to bring in a bill, a motion necessary in all cases to be assented to or carried in the affirmative before the actual bringing in of any bill. And as for the consent of the crown or the government, which it is necessary and necessary to validate any bill or any act of the Irish parliament could take up the consideration of any proposed law, with a view to its enactment, that would in practice probably be found to operate much in the same way with the assent of the crown, which even in England is not necessary. The only thing necessary, and that is the validity, is the assent of the crown of both houses. In the Irish as well as in the English parliament there was in fact an opportunity of discussing the proposal without the permission of the crown. An Eng- lish bill in Irish bill required the consent of the crown before it would become law. An Irish bill was scarcely been sufficiently attended to in comparing the circumstances of the two legislatures. The practice of presenting heads of bills however was not introduced into the English parliament till the time of the revolution. In the reign of Charles II., according to Lord Mountmorres, 'the council framed bills altogether; a negative alone on them and their several proviso was left to parliament; only a general proposition for a bill, by way of address to the lord-lieutenant and privy council, was necessary.' In the reign of Henry VII., it was allowed that those only were binding upon Ireland in which that country was specially named or included under general words.

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ment was extinguished, and it was enacted that the United Kingdom should be represented in one and the same parlaiment, to be called the parliament of the United Kingdom of Great Britain and Ireland.

The earliest laws, the statutes on record are of the year 1310; but from that date there are none till the year 1429, from which time there is a regular series. The whole have been printed, and there are also abridgments by Bullingbrooke, with a few by other hands. The first two volumes of the Blackstone's Commentaries; Oldfield's Representative History of Great Britain and Ireland; Wakefield's Account of Ireland; Hall's Constitutional History of England.

The state of Parma consists of three territories, which were formerly separate states, namely Parma, Piacenza, and Guastalla; and it is divided for administrative purposes into five districts. A road leads from Parma to Conegliano, passing through the towns of Vercelli and Massa, and then through Veja, Piacenza, and Guastalla, and finally to Parma, and is about 1,600 miles long. The town of Parma is the capital of the state, and is situated on the river Parma, which rises in the Abruzzi, and flows northwards by Bobbio, a small town and a bishop's see in the Sardinian territory. Bobbio was once celebrated for its monastery, one of the oldest in Italy, now suppressed, and its library, originally a MSS. of which, transferred to the Ambrosian library at Milan, have been the objects of sale and purchase, and are now in the British Museum. The state of Parma, and, after a course of about 50 miles, joins the Po above Piacenza. The Trebbia has an historical name, and on the banks of the river, near the town of Piacenza, is the battle of the Sempronii; and here also Sauron defeated the French under Macdonald, after three days' desperate fighting, on the 17th, 18th, and 19th of June, 1799, in which the French lost 6000 killed or wounded, and 3000 prisoners, whilst the Austrians had about an equal number of killed and wounded. East of the Trebbia flows the Nera, which enters the Po below Piacenza. Further east is the Taro, the largest river of the state of Parma, which rises in the Ligurian Alps, and after flowing through a deep and long ravine, passes a town called by its name, and is joined by the Adda on its left bank. The Taro flows through the town of Piacenza, and continues its course to the town of Piacenza, and finally to the Nera, at the eastern extremity of the state; its small territory is confined between the Modenese state and the Po; it is a bishop's see, has a cathedral, a clerical seminary, a public library of 6000 volumes, and about 3000 inhabitants. Guastalla was for a time a separate duchy, the history of which has been written by Father Atto, the historian of Parma. A very good map of the state of Parma was published at Milan in 1828.

The seat of Parma is the city of Parma, and the country of the duchy of Parma, situated in a fine plain about 12 miles south of the Po, is rather more than four miles in circumference, and is surrounded by walls and ditches: it is a bishop's see, and has 36,000 inhabitants. The streets are wide and straight, but present somewhat dull and deserted. Parma has a 'scuola superiore,' or lyceum, with chairs of theology, medicine, and philosophy, attended by about 400 students; a secondary or grammar school, two colleges for boarders, besides a military college, a school for the arts, a house of education for young ladies, seventeen elementary schools for boys and seven for girls. The public library, which was opened in 1770, contains 80,000 printed volumes and 4000 MSS.; it was increased in 1816 by the purchase of the library of the Hermitage, containing 3400 volumes, and is now in the possession of the Hebrew and Oriental MSS. (Manuscript Cod. Hebraici Biblioth. J. Bapt. De Rossi, accurat e ad eodem descripti et illustrati, 3 vols. 8vo. Parma. 1805-3.) Among the curiosities in the Parma library is a Koran which was found in the year 1586 on the island of Cyprus, known for their literary works, Piccardi, Atto, and Pezzana. The museum has 20,000 medals, and many inscriptions, bronzes, and other remains of antiquity, dug up at Velthea (Veii), an ancient town situated at the foot of the Apennines, and near the village of Macerata, not far from the river Nera.

The Ducal Gallery has many valuable paintings by Correggio, Guercino, the Caracci, Parmigianino, and other great artists.
masters: among the rest is the celebrated St. Jerome, by Correggio, which was sent to Paris by Bonaparte, but was returned in 1815; and the beautiful Madonna di S. Andrea, called la Soledella, another masterpiece of that great artist. The ducal palace has nothing remarkable in its architecture.

Most of the churches of Parma are adorned with paintings by Correggio. The most remarkable buildings are: the cathedral; the Baptistry, which is built of marble and adorned with numerous statues and frescoes; St. John the Evangelist; l'Annunziata; and la Madonna della Steccata, which contains the tombs of the dukes of Parma, among others that of Alessandro Farnese. In the convent of St. Filippo, an exquisitely painted by Correggio, and the Palazzo del Giardino is adorned with frescoes by Agostino Carracci and Cignani. The great theatre Farnese, the largest in Italy, has not been used for many years, and is now in a dilapidated state. A new theatre, of more moderate dimensions and better suited to a town of the size of Parma, was finished in 1829. The printing establishment of the late Bodoni deserves to be visited; his splendid editions have however much fallen in price of late years. Several palaces belong to the nobility also deserve attention.

Parma has a Monte di Pietà, founded in 1488 by Father Bernardino da Feltri, a philanthropist who invented this kind of institution for the accommodation and relief of the labouring classes. Among the other beneficent institutions of Parma is the Hospital for Incurable Patients, in which are a number of mechanical trades, a house for the poor, another for the insane, and a school for midwives, all founded by the present duchess, Maria Louisa.

The country residence of the dukes at Colonnare, a few miles from Parma, consists of a large mansion with extensive gardens: another villa, called Casino dei Bochi, near Sala, to the south of the capital, seems to be preferred by the present duchess as a summer residence.

Selva Piana, a wood 15 miles distant from Parma, on the road to Vercelli, has a beautiful and extensive view, was a favourite residence of Potrarch; but the house in which he lived no longer exists.

History.—Parma was once a town of the Etruscans, and afterwards the seat of a bishopric. It was made a municipality at the same time as Mutina (Modena), a.c. 183. (Livy, xxvii, xix, 55.) Martian speaks in several places of the abundance of its flocks and the fineness of their wool: and Pliny extols the salubrity of the climate. Of the ancient town of Parma nothing remains but two military columns, which are in the little square near the church of la Stecata, a sarcophagus, and a cippus, with an inscription, in which Parma is styled 'Colonia Augusta.' (Valery, Voyages Litteraires, b. viti, c. 10.)

These two monuments stand in front of the cathedral.

Parma was subject successively to the Goths, the Lombards, and the Carlingvians; it afterwards governed itself for a time as a republic, like its neighbours Piacenza, Modena, Reggio, and Bologna, and it generally sided with the Guelph party and opposed the Ghibellines. It invaded a Lombard, who was defeated under the walls of Bologna, Modena, and other Guelph towns. Parma afterwards was possessed in succession by the Visconti of Milan, and by Can della Scala, lord of Verona, after whose death the citizens placed themselves under the allegiance of the pope; but in 1334 the family of Correggio drove away the papal governor, and took possession of the government. It afterwards returned under the dominion of the Visconti, and then of the papacy, till 1382, when Francesco d'Este, duke of Ferrara, having conquered the duchy of Milan, took Parma also: but in 1512, Pope Julius II., having driven away the French, took Parma and Piacenza, and annexed both to the papal dominions. Francis I. having conquered the duchy of Ferrara, he gave it to his young sister and Duke Leopold I.: but Leop afterwards joined Charles V. against the French, the latter were again driven away from Italy, and Parma and Piacenza returned to the papal allegiance. Pope Paul III., in 15J5, created his son, Pier Luigi Farnese, duke of Parma, tributary to the pope; but the emperor Charles V., who, as duke of Milan, asserted his claims over Parma and Piacenza, refused to grant him the investiture, and the question of the sovereign dignity continued for some time to be a subject of controversy between the House of Austria and the Farnese family. The dukes Farnese soon found that it was their interest to be on good terms with their powerful neighbours the Austrian sovereigns of Milan, especially as the succeeding popes had no longer any tie of connection or interest with the Farnese family. Odoardo Farnese had even a passing quarrel with Pope Urban VIII. on account of his territories of Castro and Roncegno. (Farnese.)

In 1767, the duke Francesco Farnese having acknowledged himself a feudatory of the emperor, and as such having paid a tribute, Pope Clement XI. protested against this measure, and even issued a bull of excommunication against the Austrian troops and their commanders, who were at that time quartered in the state of Parma, which Clement qualified as a serfdom. In consequence of this, and a kind of war which Pope Urban VIII. carried on against the duchy, the emperor Joseph I. replied, by a spiritual declaration, that the states of Parma and Piacenza were old dependencies of the crown of Italy, and that the dukes Farnese had repeatedly acknowledged this by asking and receiving the absolution from the pope's excommunication. The document is called "Domini Temporale della Sede Apostolica nel Ducato di Parma e Piacenza, libri iii., fol. Rome, 1720." The whole history of the controversies between the court of Rome, the dukedom of Parma, and the House of Austria, on account of its old dependencies in Italy, is contained in the book of Domenico the "Storia d'Italia," books viii., ix., xxiii., xxxvii., xxxviii., and xxxix., notices these transactions at some length.

The dynasty of Farnese continued to reign at Parma and Piacenza till the extinction of the male line of that family in 1732, when the dukedom of Parma passed to Queen Maria Louisa of Spain, claimed the duchy for her son the infant Don Carlos, to whom the last duke had bequeathed it. The pope protested; but his protest was disregarded, and Don Carlos took possession of Parma in 1732. In the subsequent war of the Austrian Succession, Parma and its dependencies were captured by the Austrians, and afterwards retaken by the Spanish in 1745. By the peace of Aix-la-Chapelle, 1748, Don Carlos having become king of the Two Sicilies, his younger brother the infant Don Philip of Parma, and the duchy of Parma and Piacenza, and Guastalla, Philip, with the assistance of his minister Durillot, administered his states with great skill.

He died in 1765, and was succeeded by his son Don Ferdinand, during whose minority the minister Durillot proceeded with the most energetic measures for the recovery of the most thriving and best governed states of Italy.

At Ferdinand's accession a repetition of the usual controversy took place with the court of Rome concerning the title by which, the latter being submitted as an acknowledgment of vassalage, the infant Don Philip of Parma, and Durillot, with the assistance of his minister Durillot, conducted the interest of the duchy regarding the rights of the infant Don Philip of Parma, and the duchy of Parma and Piacenza, and Guastalla, Philip, with the assistance of his minister Durillot, administered his states with great skill. Ferdinand, after he came of age, dismissed Durillot, and gave himself up to the guidance of the clergy, occupied himself much more with devotional practices than with the affairs of the administration. When Bonaparte made his revolution of 1796, Ferdinand was rudely deprived of his kingdom of the Western States, which he had been made to purchase by giving up twenty of his most valuable paintings, besides two millions of francs, several thousand head of cattle, corn, and other provisions for the French army. Notwithstanding this the country was occupied by French troops, and in 1805 a treaty was concluded between France and Spain, by which the state of Parma was to be given up to France at the death of the duke, and Ferdinand's son, Ludovico, was proclaimed in his stead. Ferdinand, after the death of Ferdinand II., who was the last of the male line of the Farnese, was dismissed from the throne and driven from the country, and the throne of Parma and Piacenza accepted by the infant of the House of Bourbon of Spain, who had been named king of Etruria, Ludovico, having died in 1803, his wife, Maria Luisa of Spain, administered the kingdom for her son Carlo Ludovico, till 1805, when they were both ceremoniously removed from Tuscany by Napoleon, and allowed to reside in France, with their retinue of 300 persons. After this, the Duchy of Parma and Piacenza was restored to the House of Bourbon of Spain, in consequence of the Treaty of Paris, 1814, the Congress of Vienna decided that the dukery of Parma and Piacenza should be the province of the house of Maria Louisa of Austria during her lifetime; that the dukedom of Etruria should be occupied by the successor of the deceased, and after the death of Maria Louisa of Austria, the Duke of Leuchtenberg, of the House of Leuchtenberg, was restored to the possession of the dukedom of Parma. The dukedom of Parma was restored to the House of Parma and Piacenza, and Ludovico was appointed governor of the Grand-Duchy of Tuscany.
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Parma is therefore at present under the government of Maria Louisa, archduchess of Austria and former empress of France. The government of this princess is generally acknowledged to be mild and adapted to secure the welfare of the people. New codes have been compiled and published. The civil code is liberal in its spirit; the penal code is rather severe, especially with regard to political offenses; trials are public. There are civil and criminal courts of law, and a council of appeal in each of these towns.

The revenue amounts to about seven millions of livres, or 280,000 pounds sterling; there is a funded debt of 7,000,000 livres. The military establishment consists of about 8,000 men.

The number of the secular or parochial clergy is 2470, and that of the parishes 763; the number of monks and friars is 416, and that of nuns 245. (Serristori, Statistica d'Italia.) The number of boys and girls who attend the elementary schools is about 7900. Twenty-five freemasons are still without schools.

(Valerio; Neigeaur; Aflà, Storia della Città di Parma, 4 vols. 410, 1795; Aflà, Memorie degli Scrittori e Letterati Parnigiani, 5 vols. 410, continued by Pecazza; Donato, Dizionario del Gran Tevere, 8 vols. 1817; Fiore della Ducale Galleria Parmense, published by Bodoni in fol.; Donato, Nuova Descrizione della Città di Parma, 2 vols., 1824; Corteisi, Saggi Geologici degli Stati di Parma, (in press.)

PARMA, DUKE OF. [Parner.]

PARMACELLA. [L. max, vol. xiii, p. 487.]

PARMENIDES (Παρμενίδης), the second in the series of the Eleatic philosophers, was a native of Elea. He was descended from a noble family, and is said to have been inducted to study philosophy by Ameinias. (Diog. Laert., ix, 21.) He also stated to have received instruction from Docherates, the Pythagorean, to whom he erected an heroum. Later writers inform us that he heard Xenophanes, the founder of the Eleatic school of the Peloponnesus. (Diog. Laert., ix, 21.) He speaks of it with some doubt. We read that Parmenides gave a code of laws to his native city, which was so highly esteemed that at first his laws were taken an oath every year to observe it. (Diog. Laert., ix, 23; Plut., Adv. Colot., 32; Strabo, vi, 347.)

The time when Parmenides lived has been much disputed. According to Plato (Parmenid., p. 127), Parmenides, at the age of sixty-five, accompanied by Zeno, at the age of forty, visited Athens during the great Panathenaeae, and stopped at the house of Gaugamela, according to Aristotle (Met., i, 5), he resided at Athens. (Diog. Laert., ix, 21.) He was born about b.c. 454 (Clint, Fast. Hellen., p. 364), Parmenides would have been born about b.c. 519. But to this date two objections are urged; first, that Diogenes Laertius (ix, 23) says that Parmenides flourished (φείδοισθαι) in the 69th Olympiad, and Cato (Senec., de Ass. ii. 6, 69) refers to the period of Cato the Elder. (Diog. Laert., ix, 21.) He would only have been about sixteen in the 69th Olympiad; and secondly, that Socrates is stated by Plato, in his dialogue entitled Parmenides, to have conversed with Parmenides and Zeno on the doctrine of ideas, which we can hardly believe Plato would write a dialogue on Plato, that he also wrote time was only thirteen or fourteen. Athenaeus (xi, 505) accordingly censures Plato for saying that such a dialogue ever took place. But in reply to these objections it may be remarked, first, that little reliance can be placed upon the vague statement of such a careless writer as Diogenes; and, secondly, that though the dialogue which Plato represents Socrates to have had with Parmenides and Zeno is doubtless fictitious, yet it was founded on a fact that Socrates' contemporaries were in the habit of referring to the knowledge of the Eleatic philosophers. (Diog. Laert., ix, 21.) Plato mentions, both in the 'Theaetetus' (p. 183) and the 'Sophistes' (p. 127) that Socrates was very young (παρ' τὸν χρόνον) when he heard Parmenides.

We have no other particulars respecting the life of Parmenides. He is said to have lived on the island of Samos, and the latter he lived on the most intimate terms. (Plat., Parm., 127.) He is always spoken of by the ancient writers with the greatest respect. In the 'Theaetetus' (p. 183) Plato compares him with Homer; and in the 'Sophistes' (p. 237) he calls him the 'Great.' (Comenius, Aristot., Met., i, 5.)

Parmenides wrote a poem, which is usually cited by the title 'Of Nature' (ἐπὶ τῆς φύσεως (Sex. Empir., Adv. Mathem., viii, 111; Theophrastus, Ap. Diog. Laert., viii, 55), but which also bore other titles. Siduslas (Parmenides) calls it θεολογία, and adds, on the appearance of Plato (Soph., p. 237) however, to which Suidas refers, perhaps only means an oral exposition of his system, which interpretation is rendered more probable by the fact that Sextus Empiricus (Adv. Mathem., vii, 111) and Diogenes Laertius (i, 16) expressly state that Parmenides only wrote one work. Several fragments of this work, 'On Nature,' have come down to us, principally in the writings of Sextus Empiricus and Simplicius. They were first published by Stephanus in his 'Poesia Philosophica' (Par., 1273), and by Gellius (xilographus) in verse. Zillichau, 1795. Brandis, in his 'Commentationes Eleaticae,' Hafniæ, 1813, also published the fragments of Parmenides, together with some of his other fragments. Brandis, in his 'Philosophorum Graecorum veterem, praesertim qui ante Platonem floruerunt, Operum Reliktrum,' Brux., 1835.

The fragments of his work which have come down to us are sufficient to enable us to judge of his general method of subject. He appears to have been inclined to exhibit the soul's longing after truth. The soul is represented as drawn by steeds along an untraveled road to the residence of Justice (Δίκη), who promises to reveal everything to it. After this introduction the work is divided into two parts; the first part treats of the truth, and the second explains the physiological system of the Eleatic school, of which an account is given under ELASTIC PHILOSOPHY.

PARME'NO, a Macedonian general, who distinguished himself in the service of Philip, father of Alexander the Great. He gained a decisive victory over the Illyrians, about the time of Alexander's birth, and the news of both events reached Philip, who was then absent from his capital on some expedition. It is a tradition of his that Philip died of the Olympic games. Philip, while preparing to invade the Persian empire, sent a considerable force into Asia, and he chose Parmenio and Attalus as the leaders of the expedition. These commanders began by expelling the Persians from several of the Great towns in Asia Minor. Parmenio took Gryneum in Asia, the inhabitants of which, having sided with the Persians, and fought against the Macedonians, were sold as slaves. When Alexander set out on his Asiatic expedition, Parmenio had one of the chief commands, and he was not known until he had well reconnoitred the ground. Being in command of the left wing, he was attacked in flank by the Persians, and was for a time in some danger, until Alexander, who had been successful in another part of the field, came to his assistance. Parmenio, who had already captured the city, and took possession of the Persian camp, with the elephants, camels, and all the baggage. When Alexander marched beyond the Caspian gates in pursuit of Darius and Bessus, he left Parmenio, who was now advanced in years, in Media, at the head of a considerable force. Some time as a king Alexander was encamped at Artaeum, a conspiracy is said to have been discovered against his life. The informer was a boy of infamous character, and the persons accused were officers, though not of exalted rank. The informer said that he had first told his secret to Philotas, the son of Parmenio, who had daily access to Alexander, but who had taken no notice of it for two days, at the end of which time, through the means of another officer near Alexander's person, the informer brought the matter to the king. There was great suspicion upon Philotas, who however was not implicated by either the informer or any of the accused in their confessions. But Craterus, who had an old jealousy against Philotas, on account of the favour the latter enjoyed with Alexander, endeavoured to excite against him a suspicion which he had collected what Philotas had said at the time when he claimed Jupiter Ammon for his father—he pitied those who were doomed to serve a man who fancied himself a god. Craterus had also for some time previous bribed a courtezan kept by Philotas, who reported him to the king, and thus got all the boastful vapourings and expressions of discontent uttered by Philotas in his unguarded moments. In short, Alexander, according to Curtius, was induced to order Philotas to be tortured, in consequence of the suggestions of Craterus, Hephaestion, and others of the king's companions. Cneus, who had married the sister of Philotas,
lotus, was one of the most violent against the accused, for fear, it was supposed, of being thought an abettor of his brother-in-law. The torture was administered by Craterus himself, and Philotas, after enduring dreadful agonies, confessed, though in vague terms, that he had conspired against the life of Alexander, and that his accomplice was a certain Philomelos. This being considered sufficient evidence, Philotas was stoned to death, and Alexander despatched a messenger to Media with secret orders to Cleander and other officers who were serving under Parmenio, to put their command in execution. The unexpected news, with the circumstance that his officers, was run through by the body of Cleander. This is the substance of the account of Curtius (vi. and vii.), a compiler by no means unfavourably disposed towards Alexander.

Afterwards, so far as he derived knowledge of these occurrences from the work of Ptolemy, briefly says that Philotas was charged by Alexander, before the assembled Macedonians, with having conspired against him; that Philotas at first succeeded in justifying himself; but that afterwards fresh evidence was produced to criminate him, and among other arguments urged against him on his trial, one of the strongest was, that having received information of a plot against the king's life, he did not reveal it, although he had access to Alexander's person twice a day. The result was, so far as Philotas related his case, he and his associates were run through with spears by the Macedonians. Alexander despatched Polydamnus to Media with letters for Cleander, Sitalces, and Memnon, three officers who were serving under Parmenio, to put the commands in execution; but to desire to attend the orders of Alexander: 'Whether it was,' Arrian observes, 'that Alexander thought it unlikely that Parmenio should be ignorant of the treachery of his son Philotas, or that, even if he was ignorant of it, it appeared to Alexander more convenient to have the advantage of the execution of his son, especially as Parmenio's authority was so great with the troops, both Macedonian and auxiliary.' (Arrian, b. iii.)

Whatever may be thought of the trial and execution of Philotas, it appears to have been at least a summary and unsatisfactory proceeding, the murder of Parmenio and the manner of it form one of the darkest blots in Alexander's character. Parmenio was evidently sacrificed in cold blood to what have been styled in after ages' reasons of state. He was seventy years of age; he had lost two sons in the campaign of Alexander, and Philotas was the last remaining to him. Parmenio appears to have been a steady, brave, and prudent commander.

An instance of the careless manner in which history has been so often unhallowed upon, even by writers of eminence, appears in Montesquieu (Esprit des Lois, x. 14), where he sums up the character of Alexander by saying that 'he committed two bad actions, burning Pergamum and killing Cleopatra. He himself lived both by his genius, and came to be looked upon rather as misfortunes than as crimes.' Montesquieu says nothing of the murder of Parmenio, nor of that of Callisthenes, deeds of darker guilt than those which he mentions, the former of which is doubtful, and the second has at least the excuse of being the result of a drunken brawl.

PARMIGIANO, Francesco Mazzuoli, sometimes called, in the diminutive form, Parmigianino, was born at Parma in 1503, and was the son of Filippo Mazzuoli, called dell'Erbetto. He studied painting under his uncle Michele and Filippo and his countryman Marcitta. In his sixteenth year he finished a picture of the Baptism of Christ, now in the palace of Count Sanvitati. Correggio's visit to Parma in 1521 made him acquainted with that master, and in 1527 he went among other works, a Madonna with the Child, and St. Jerome and St. Bernard in (the convent Della Nunziata), but which has suffered from time and the hands of time. In his sixteenth year he painted under Pope Clement VII. proofs of his skill, he went in 1523 to Rome, and as part of the sight of the works of Raphael made a deep impression on him. In his subsequent works he endeavoured to combine with the grace of Raphael the contrasts of Michael Angelo's nude and harmonious, where he was called Il Raffaellino. On the taking of Rome, 1527, when he sustained considerable loss, he went to Bologna, where the engraver Fantuzzi, commonly called Antonio de' Tintori, stole several of his drawings, which were afterwards found in the collection of the Earl of Arundel, and brought back to Italy by Count Zanetti, who published them in 1749, admirably cut on wood and printed in colours.

Among the finest works executed by Parmigiano at Bologna were St. Rochus, painted for the church of St. Louis in the city, and St. John the Baptist in the Ursine Gallery, which he had changed from a Venus to a Madonna, and the St. Margaret. He afterwards returned to his own country, where he painted the Cupid fashioning his bow, with two infants at his feet, one laughing, and the other crying, who is from a picture of the infant Christ returning to the temple adorned with several paintings the newly built church Dea Stieccata. But his health being greatly weakened, he was unable to work, and the directors of the building threw him into prison, as he had received a sum of money for a picture, and had nowhere set his hand to complete the work; but indignant at this treatment, he fled to Cassal Maggiore, where he died in 1540. His works, especially his easel pieces, are very scarce. The predominant features of his style are elegance of form, grace of countenance, courtesy in the attitudes, perfection of chiaroscuro, and the charm of colour. But the figures are often characterised by excessive emotion rather than real elegance of form, and his grace sometimes degenerates into affectation and his contrasts are not arranged so as to imitate the effects rather than the principles of his masters. Parmigiano was celebrated for the care of freedom with which he designed, and for those bold strokes of Design which he seeks to communicate to the altar pieces by him: the most valued is that of St. Margaret in Bologna, a composition rich in figures, which was studied by the Carracci, and which Guido even prefers to the St. Cecilia of Raphael.

The works both of Parmigiano are universally known as models of taste, delicacy, and freedom. He was erroneously considered as the inventor of the art of etching, which was practised by Albert Dürer before him; but he was the first who introduced it into Italy.

PAPYRUS. [Chrysochroa Bactria, vol. iii. p. 444 et seq.]

PARNASSOS (Parnassos), the name of a mountain chain in Phocis, which extends in a north-easterly direction from the country of the Locrians to Mount Oeta, and is a south-westerly continuation of the mountains of Phocis itself; it joins Mount Helicon on the borders of Boeotia. Strabo (ix. p. 316. Casaubon) says that Parnassus divided into two parts; but the name was more usually restricted to the lofty mountain upon which Delphi was situated, the mountain of the Muses, also called Larnax, because the ark or larnax of Demeter landed here after the flood. (Compare Ovid, Met. i. 11.) Pausanias (x. 6, 1, 1) derives the name from Parnassus, the son of Poseidon and Cleopatra. It is called at the present day Liakura.

Parnassus is the highest mountain in central Greece, Stirabos says (viii. p. 379) that it could be seen from the Acrocorinthus in Corinth, and also states (viii. p. 481) that it was of the same height as Mount Helicon; but the latter point he was mistaken, according to Constantine Louke, who informs us (Travels in Northern Greece, vol. i. p. 327) that Liakura is a little under four hundred feet higher than Paleorunia, which is the highest point of Helicon. Parnassus was the highest part of the mountain where the hunters of 'snowy' animals resided in the ancient time. (Ed. Tyr. 473; Eurip. Phoen. 214) When the Brennus invaded Greece, we learn from Pausanias (i. 2, 3, 4) that it was covered with snow.

Above Delphi are many rocks, from which the mountain is frequently called by the poets the peagheaded ( homicide), one of which is called Hyampia, but which were usually called Phaedonius. Between these two rocks the celebrated Castalian fountain was situated. Above Delphi are some rocks, from which the Poetical Etre' tree. (Doddwell's Travels, vol. i. p. 172.) Above the spring, at the distance of 60 stadia from Delphi, was the Corycian cave, sacred to Pan and the Corycian nymphs, which Pausanias (x. 32, 2, 5) speaks of as superior to every
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other known cavern. (Compare Strabo, ix, p. 417.) When the Persians were marching against Delphi, a great part of the inhabitants took refuge in this cavern. (Herod., vii. 37.) It is described by modern traveller (Halkias, in Walpole's Collection, &c., vol. p. 312) as 330 feet long and nearly 200 wide. As far as the cave from Delphi was accessible by horses and mules, but beyond it the ascent was too steep for an active man (Delph.

Paus., x. 32, s. 2, 5.) The summit of the mountain of Paros, at the distance of 89 stadia from Delphi (Paus., x. 32, s. 6), was the town of Tithorea or Neon, the ruins of which are near the modern village of Velitza. Paus. (v. 10) account of the inhabitants of the neighbourhood of the Paros, see Phocis.

PARNELL, THOMAS, was born in Dublin in 1679. He entered Trinity College, Dublin, at the age of 13, and became Master of Arts in 1700. In the same year, though under 18, he took his father's orders, and in 1703 received the archdeaconry of Clogher from Dr. Ashe, the bishop of the diocese. Nearly at the same time he obtained the rectory of Par on the island, and was afterwards made a prebend of the cathedral. The Paro

of the Cyclades, is situated west of Naxos, from which it is separated by a channel five or six miles wide. Paros is estimated to be about one half the area of Naxos: the surface of the island is hilly but not hilly, the hills are not so high as those of Naxos: it produces corn, abundance of fruit, and has flocks of sheep and herds of swine, and plenty of partridges and other game. The population, according to Thiersch (Etat de la Grèce), is 2163. Paros is one of the two islands of the last century, when Olivier visited the island. But Paros was then suffering under the infraction of a yearly visit from the captain-pasha's fleet, which anchored in the port for several weeks in the summer, in order to collect the capitation-tax levied on the principal objects of commerce. During this time all kinds of oppression and extortion were practised by the Turks upon the defenceless and dispirited inhabitants. Tournefort, a century earlier, bore witness to the same kind of treatment. The island, called Parachia, is in the site of the ancient town, in the inner recess of a bay on the north-west coast of the island. The principal harbour is on the north-east coast, and is the finest in the archipelago. The mountain Marpessa, now called Cephalus, near the centre of the island, abounds with white marble, which was often used by the ancient sculptors. On a rock above the entrance of one of the quarries Tournefort saw a bason-rileno representing, as he conjectured, a Buddhist feast, some of the figures of which were unfinished. There are four or five springs on the island, besides the principal, and several Greek monasteries scattered about.

Paros is said to have been colonised by the Cretans, and to have been at one time called Minos, from Minos, king of Crete. It attained a great degree of prosperity by its maritime trade, and for a long time was regarded as the chief port of the Cyclades.

When Darius invaded Greece, the inhabitants of Paros submitted to the Persians, and furnished sailors for the Persian fleet, in consequence of which, after the battle of Marathon, Miltiades went with an Athenian squadron to attack the island; but he failed in the attempt, and received the wound of which he shortly after died. [Miltiades.] After the defeat of Xerxes at Salamis, Themistocles offered Paros to pay tribute to Athens. The island afterwards underwent the same vicissitudes as the rest of the Cyclades, and until it was joined to the Greek confederacy, it formed for a time part of the dukedom of Naxos, but afterwards became a separate principality of the Venetian family of Veniero, under which it remained till Barbarossa took it in the sixteenth century. During the war of Cannae in the following century, the Venetians landed on Paros, but soon after abandoned it, after destroying the olive plantations, the principal wealth of the island. In the latter part of the eighteenth century, the Russians took possession of Paros, and made it for a time the station of their fleet. It now belongs to Greece.

The Greek inscription called the 'Parian Chronicle' was found in this island.
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West of Paros, and separated from it by a narrow channel, is the smaller island called Antiparos, formerly Olearus. The island produces some corn, and contains a village which is inhabited by fewer than one hundred people. Antiparos is noted for its natural cave or grotto, one of the largest and finest that is known. It is described by Tournefort in his Travels, who gives a print of the interior.

PAROTIA. [Bird of Paradise, vol. iv., p. 420.]

PAROTID GLAND (ototis, "the ear") is the largest of the three principal glands by which the saliva is secreted and poured into the mouth. The parotid glands are situated, one on each side of the face, behind the ascending part of the lower jaw, and below and in front of the ear. The most anterior part of each gland lies upon the masseter muscle, immediately beneath the skin of the face, at the most backward part of the cheek; and hence the main duct passes forwards, penetrating obliquely through the fat of the cheek and through the buccinator muscle bulging, the course of this duct is nearly opposite to the second molar tooth of the upper jaw. The more posterior part of the gland is placed in an intricate manner among the tissues behind the jaw and beneath the outer part of the base of the skull, fitting into the irregularities that are left between them, and in some parts passing very deeply down beneath the skin.

The structure of the parotid, like that of all the glands secreting saliva, is lobulated, being made up of a number of lobules, the term lobulation of the branchial duct, upon which rests a network of capillary blood-vessels is arranged, and which are collected together in uncertain numbers to form the lobules of which the whole gland is made up. [Digestion.]

Digestion.

It is to the parotid gland that is subject to the mumps. [Mumps.] It is often attacked with inflammation and suppuration in the course of severe fevers, and is liable to be affected by the different kinds of malignant growths, as cancer, fungus humataclae, &c. In these cases the whole or the anterior part of the gland has sometimes been removed with success, but the operation must be considered one of the most dangerous and uncertain in surgery. Wounds of the parotid duct, which, from its exposed situation, are not rare, often lead to the formation of salivary fistulas, the constant flow of saliva through the open aperture preventing the complete healing of the skin, and thus establishing a permanent opening on the exterior of the cheek, through which the saliva flows. To prevent this evil, the sides of any wound in which it is suspected that the parotid duct is involved, should be laid open, and the peculiar care, and held in exact apposition by gentle compression: for its cure, when the fistulous opening is formed, an operation is generally necessary, which consists in perforating the interior of the cheek from the outer opening, and then endeavouring, by compression of the latter, to turn the course of the saliva inwards, and restore the natural passage into the mouth.

PARR, CATHERINE. [Henry VIII.]

Parr was born Harrow-on-the-Hill, 1747, where his father was a surgeon and apothecary. He was early distinguished for his love of books and his aptitude at learning. He received his education at the grammar-school of Harrow, and gave the highest satisfaction to the masters under whom he was placed, and who predicted his future eminence. In his fifteenth year he was removed from school and put to the business of his father. But the progress he had made in classical literature, and the intellectual habits he had formed, enabled him to continue his studies with the greatest advantage. The constant flow of information, the constant use of the library, disgusted with the employment selected for him, and having early displayed a grave and serious disposition, a predilection for the clerical profession, and an attachment to ecclesiastical pomp and circumstance, it was at length determined to send him to the university. Accordingly, in 1760, in his nineteenth year, he was entered at Emmanuel, College, Cambridge, where he appeared with great diligence to classical and philological pursuits. But his father dying soon after, he was compelled, before he had taken a degree, to relinquish his academic career, where so bright a prospect was opening upon him, and in 1767 became one of the assistant in Harrow School. In this situation he remained five years, with the greatest credit to himself, and on the death of Dr. Somner, offered himself as a candidate for the mastership, on which occasion a proposition was made to the governors, that he was the ostensible, while in all probability his politics were the real objection against him in the mind of the governors. With bitterness of spirit he now left the place of his birth and the scenes of his boyhood, and kept a house of fashionable students at Stanmore in the same county.

In 1786 he settled at Hatton, in Warwickshire, in the small living of which place he had been presented, and here he spent the remainder of his life, in discharging the duties of his parish, in the instruction of youth, and in social charities which were all the objects of a religious and benevolent heart.

Parr was a man of great talents, of very extensive learning, and of pre-eminent conversational powers; but was vain, arrogant, and overbearing. His friends only represented him as possessing much benevolence and goodness of feeling; but he required the most abject submission, and exacted the most slavish attention from all who approached him; neither was he accessible, nor was the law of political rights fairly observed by any of his political foes, by whom he was considered a man of generous principles and a friend to the nation. He published a "Travels by Warburton and Warburton"; to annoy Bishop Hurst, the editor of Warburton; and felt no compunction about injuring the fame of the great Bishop of Armagh. He could only quarrel with the former, who had given him an offence save what an inordinate and morbid self-centred man might imagine. In his literary and political disputes he never faltered, and declaimed with the force of party-feelings; he asserted that the nation owed all its greater and less important advantages to the English nation and the English nation only.

PARRA. [Ruelle.]

PARRAH, (MEXICAN STATES.)

PARRHASIUS, son and pupil of Eresus, was a native
of Ephesus, but became a citizen of Athens. He raised the art of painting to perfection in all that is exalted and essent-
tial. He compared his three great predecessors with one another, rejected that which was unprecedented, and adopted
that which was admirable in each. The classic invention of Polygnotus, the magic tone of Apollodorus, and the ex-
quisite design of Zeuxis, were all united in the works of Par-
hasius; what they had produced in practice he reduced to the
theoretical, and taught them. His relations with Philon and
Thamyris (Inst. Or., xii. 10), all the powers and objects of art, that he
was termed the Legislator; and all contemporary and sub-
sequent artists adopted his standard of divine and heroic
proportions.

Parhasius himself was aware of his ability: he assumed the
euphemism of the Elegant ( Ἀφεδρόσημος), and styled himself
Prince of Painters; he wrote an epigram upon himself (Ath. xii. p. 343. Casaub.), in which he proclaimed
his birth-place, celebrated his father, and pretended that in
himself he had united the forms of Zeuxis and Apollodorus,
and his sandals were bound with golden straps. (Elian, Var.
Hist., ix. 11.) It appears then that Pliny justly terms him the
most insolent and most arrogant of artists. (Hist. Nat.
xxxvii. 118.)

The branch of art in which Parhasius emphatically excelled
was a beautiful outline as well in form as execution,
particularly in the extremities, for, says Pliny, when com-
pared with himself, the intermediate parts were inferior.

Parhasius (28) in the time of the tyrants, had an allegorical figure of the Athenian people, or Demos. Pliny
says that it represented, and expressed equally, all the good
and bad qualities of the Athenians at the same time; one
might trace the changeable, the irritable, the kind, the un-
just, the vainglorious, the wise, the simple, the fierce,
and the timid. How all these contrasting and counter-
acting qualities could have been represented at the same
time, it is difficult to conceive; if we are to suppose it to have
been a single figure, it is very certain that it could not have
been conformed to the style of a human body. Greek art,
by symbols, is totally inconsistent with the means of the

Parhasius painted a Theseus, which, after the general
spoliation of Greece, was placed in the Capitol at Rome. It
was probably for this picture that he made a citizen of Athens
while tyrant of Sardis. While tyrant of Sardis, Pliny says,
Parhasius had fed upon roses, and his own upon beef, he
seems to have alluded particularly to the style of design, and
not, as one might suppose, to the colour; for, as Winckelmann
has shown, the branch of art Parhasius excelled in (ch. 45, nota
gentlely) relates expressly to form. (De Glor. Ath., 2.)
According to the taste of Ulysses, the figure of Parhasius
was too elegant, too delicate, too effeminate for heroic beauty.

Pliny enumerates many other works by Parhasius; a naval
borders in his armour; a Meleager, Heracles, and
Perseus, upon the same table; Ulysses feigning insanity;
Costor and Pollux; Bacchus and Virtue; a Cretan nurse
with an infant in her arms; a priest officiating, with an
attendant youth bearing incense; two youthful boys, in
which were admirably depicted the innocent simplicity of
the age, and its happy security from all care; a Phoebus;
a Telephus; an Achilles; an Agamemnon; an Eneas;
and two famous pictures of Hoplites, or heavy-armed war-
riors, one in action, the other in repose, admirably painted.

Pliny's manner of painting is very simple. The soil ought to be
deep and rather light, but by no means adhesive; and it
should be trenched to the depth of at least two feet. In order
that the roots may be clean and sound, fresh manure should not
be applied; indeed, the soil must be thoroughly plowed,
and no manure is required; and on the contrary, if it be poor,
a more liberal supply should be given in the previous season,
so that any immediate application with the parsnip
crop is not requisite.

Some may be then taken up, their tops cut off, but not too

Plutarch instances Parhasius's picture of Ulysses feign-
ing insanity as an improper subject for the pencil, yet
reconciled to our taste through the spirit of the concep-
tion and the truth of the execution for which De Apoll.

Parhasius painted a Hercules, which he affirmed was
a facsimile of the god as he had frequently appeared to him
in his dreams. (Ath. xii. 244.) He painted also a
Philoctetes. (Anth. Gr., xiv. 26.) Pliny mentions a con-
trast between Parhasius and Timarchus. (Inst. Or.,
xx. 10.) He says that the former was beaten: the subject of the picture was
the contest of Ulysses and Ajax. The proud painter, indigant
at the decision of the judges, is said to have remarked,
that the unfortunate son of Telamon was for a second
race, in the same cause, defeated by an unworthy rival.

Ath., xii. 543.)

Pliny records also a trial of skill between Parhasius and
Zeuxis, in which the latter allowed his grapes to have been
surpassed by the drapery of the former: this contest, says
Pliny, "if not a feint, was an effort of puerile dexterity.

The story told by Seneca of Parhasius having crucified
an old Olymphonian captive when about to paint a Prometheus
chained, that he might seize from nature the true expression
of bodily agony, cannot relate to this Parhasius, and is pro-
duced only to be refuted: Sedulius in his "Prometheus Tours-
neroy" (v. 10) of the preceptor of Nero. Olymphonius
was taken by Philip in the second year of the 168th Olympic, or
a.c. 347, which is nearly half a century later than the latest
accounts we have of Parhasius. Some accounts place
Parhasius in the 167th Olympic, and Parhasius must therefore have been already
celebrated before that time, from his dialogue with that
philosopher upon the principles of art as preserved by Xen-
ophon. (Mem., iii. 10.) He is even mentioned by Phaniasus
in the time of Augustus. (Hist. Ath., i. 8.) The artist
painted a battle of the Lapithi and Centaurs on the shield
of the Minerva of Phidias at Athens: supposing such to be
the case (for although improbable, it is still not imposi-
bale), Parhasius, if living, must have been at least 120 years
old in the time of Olymphonius. The Olymphonius of Go-
io, with probably as much truth; and some have
also said the same of Michael Angelo Buonarroti.

PARR. [PITTICIAB.] PARSES. [PERIA.] PARSLY. [PETRACITUM] Petroselinum sativum is a hardy biennial, a native of Sardinia, introduced into this
country about the middle of the sixteenth century. There are three varieties, two of which are well known, and
commonly used as pot-herbs, and for garnishing, namely:
the common or plain-leaved; the curled; and the Hamburg,
large or carrot-rooted, which last is cultivated only for its
roots, occasionally used as young carrots. The curled va-

rity is by far the most useful, and from its beautiful curled leaves, the Anthous Cynarinus, or
fool's parsley, a poisonous plant somewhat resembling the
plain-leaved parsley. [ERTIUS.]
closely, and the roots stored in sand in a cool place, so as to guard against the stimuli of light and heat as much as possible. This precaution of storing in the early part of winter is only necessary in case of frost becoming so severe as to render the operation of removal difficult; but the whole of the crop should be taken out of the ground before vegetation recommences in the spring, and treated as above.

Besides the use of the roots for the kitchen, a wine is sometimes prepared from them. Abounding in saccharine matter, they afford by distillation an ardent spirit, the process of fermentation being facilitated by the addition of a small portion of malt liquor.

PARSON. [BENEFACT, p. 219.]

PARTHENAY. [Bretres.]

PARTHENIUS, the ancient name of the Barton or Bartin. This river rises in Mount Olygassus, which is a continuation of the mountain-chain which runs from Mycia towards Armenia, and is known by the names of Ídia, Olympia, &c. It flows in a north-westerly direction into the Euxine, and separates Bithynia and Paphlogonia.

The country through which it flows is very fertile and beautiful. (Strabo, xii, 543; Tournori, vol. ii., p. 88.) Ovid (Ex Ponto, iv, 10, l. 49) and Ammianus Marcellinus (xxii. 8) speak of the Parthenius as a rapid stream; and Xenophon (Anab. v. 6, s. 9) says that it is impassable. It is mentioned in the Itiad (ii. 854).

The etymology of the name is differently explained. The Greek writers connect it with the Greek word perthen, a vine, and for the most part suppose that it derived its name from Artemis being accustomed to bathe in its waters. (Apoll., Argon., ii. 938.) Strabo (xii., p. 543) supposes that it was so called on account of the fertile country through which it flows: but the name was probably a native word, and had no connection with the Greek parthenos, except an accidental similarity of sound. Some modern writers imagine that it may be connected with the Hebrew-Phoenician phorath, which means fruitful. The ancient name is still preserved by the Greeks, who call it Barton, or Bartin, but it is called Dolap by the Turks.

PARTHENON (Παρθενών), the temple of the virgin goddess Athena, or Minerva, the protectress of Athens, is situated on the Acropolis of that city. This edifice was erected in the time of Pericles (about B.c. 445). The architects were Callicrates and Ictinus, and the sculptures were executed by Phidias and his assistants. This temple has always been considered the most refined example of the Grecian Doric style, and one of the noblest monuments of antiquity. Yet its grandeur was by no means owing to its extraordinary dimensions, since in point of size it falls very short of many other structures, modern as well as antient, its extreme length being only 228 feet, and its breadth 100, and the interior of the cela only 145 ft. 6 in. by 63 ft. 6 in., which is little more as to length than the size of the Elgin Hall in the British Museum, viz. 143 by 46 feet. Technically described,

* For the dimensions of the Madeleines, which is externally a peripteral Greek temple, see Paris, page 297.

Plan of a portion of the Acropolis. A, the Parthenon.

Since the establishment of King Otho's government, 1833, excavations have been made on the Acropolis and around the Parthenon, and a great number of fragments of sculpture and architecture have been brought to light. Some of the fallen columns have also been replaced, and measures taken to restore the structure as far as circumstances will permit. For particulars as to the order and its dimensions, see Column, page 353, and table, page 383.

In 1823, an edifice was begun on the Calton Hill, Edinburgh, which was, externally at least, to have been an exact model of the Parthenon, but after fourteen columns were put up, it was discontinued, nor is there any prospect of its being ever completed.
PA' THENOPE (Zoology). [PA' THENOPIANS].

This tribe, in the arrangement of M. Milne Edwards, corresponds nearly to the genus Parthenope as established by Fabricius, but the species are separated by M. Edwards into the genera Eumedonus, Eurynome, Lambri, Parthenope, and Clymena, a natural group which, in the opinion of the last-named zoologist, establishes the passage between the Miainas [MAIDEN] and the Clymenotopbes.

Characters of the Tribe.—Carapace ordinarily triangular and hardly longer than it is wide; its posterior border broader than the anterior in general, nearly transverse, and the lateral anterior borders following the same direction as the edges of the rostrum; but the lateral parts of the carapace are sometimes rounded, and its surface is nearly always bassy and tuberculous. Rostrum in general small and entire, or only notched at the end; the eyes are nearly always perfectly rearticulate; the basillary joint of the external antennae sometimes presents the same disposition as in the Miainas but in the great majority of cases it is quite otherwise; it is short, and not joined to the neighbouring parts of the shell; its external border does not concur to form the lower orbital wall, and its extremity does not reach to the front; the movable stem of these antennae is short, and takes its origin in a gap of the internal orbital angle. The epistome is much wider than it is long, and the form of the external jaw-feet is nearly the same as in the Miainas. The anterior feet are very much developed, and widen so as nearly to make a right angle with the body; in the male they are always more than twice as long as the post-frontal portion of the carapace, and sometimes four times as long; the hand is nearly always triangular, and the claw suddenly curved downwards, so that its axis forms a very marked angle with that of the hand. The succeeding feet are, on the contrary, short, and the second pair in general are less than one-half of the length of the post-frontal portion of the carapace, and the others progressively diminish. The abdomen in the male presents considerable differences in the number of distinct joints, whilst in the female there are always seven.

Geographical Distribution.—The tribe is widely distributed, and species are found in the English Channel, the Mediterranean Sea, and the Indian Ocean.

Place in the System.—The Parthenopians are placed by M. Milne Edwards between the Miainas and the Clymenotopbes.

Eumedonus. (Edwards.)

This genus, in the opinion of the last-named author, establishes in some sort the passage between the Stenoplocha of the Arhakides, and Eurynome, Lambri, and Parthenope, on the other.

Generic Character.—Carapace nearly pentagonal, as in Parthenope, but it scarcely ever goes beyond the level of the third pair of feet. Body depressed; rostrum very wide and very much advanced, and divided at its extremity only; eyes very short, their peduncle entirely filling the orbits, which are circular, a character which again approximates this genus to the Stenoploches; internal antennae bent back very obliquely outwards; external antennae a little developed; their first joint does not distinctly concur in the formation of the lower wall of the orbit; their movable stem arises in the slit which the two internal angles of that cavity leave between them nearly as in the Parthenopines, and their terminal joint is very short. The epistome is shorter than in most of the Oxyrhynches. The external jaw-feet present nothing remarkable. In the male the first pair of thoracic feet are stout and much longer than the succeeding ones; all these last are a little compressed; and their third joint is surmounted by a crest which is not distinctly visible on their other joints. The second pair of feet are rather shorter than the third and fifth, which are nearly as long as the fourth; instead of being placed on the same level, they are inserted above so as to cover one another. The abdomen is composed of seven joints, the two first of which are visible on the dorsal surface of the body. Abdomen of the female unknown to M. Edwards.

Example, Eumedonus nigerr. (Des.)

Description.—This small and only known species is remarkable for the great prolongation on each side of the carapace: these points are directed outwards, and their base occupies the whole of the hepatic region. There are some depressions on the upper surface of the carapace, which is, like all the rest of the body, covered by small miliary granulations. The rostrum is very wide, flat, slightly notched at the end, and about one-third of the length of the entire carapace. The anterior feet are armed with a strong spine which occupies the lower border of the carpus, and two small points placed on the upper border of the carpus, which is slightly tumid. The pincers are armed with some rounded teeth, and are not sensibly curved inwards. The other feet are slightly hairy. Colour bronzed black.

Locality.—Costas of China.

Eurynome. (Leach.)

This genus, in the opinion of M. Edwards, establishes the passage between the Lambri and the other Oxyrhynches. The general form of the body and its aspect approximates these crustaceans to Parthenope, whilst the disposition of their external antennae is similar to what is seen in Miainas.

Generic Character.—Carapace nearly triangular, with a rounded base, very much embossed and covered with asperities. Rostrum horizontal and divided into two triangular processes. Eyes small, set in deep pits, the upper border very projecting and separated from the external angle by a slit. The internal antennae bent back longitudinally; the first joint of the external ones terminating at the internal angle of the orbit and supporting the succeeding joint at the upper edge of its extremitv, so that the movable stem of these antennae, which is prolonged under the rostrum, appears to spring from the internal canthus of the eyes. Epistome nearly square, and third joint of the external jaw-feet much dilated outwards. Sternal pliastra nearly oval, and its median suture occupying the two last thoracic rings. First pair of feet hardly larger than the succeeding ones, rather long in the male, whilst in the female they are very short, but less notwithstanding than the second pair: the succeeding feet progressively diminish in length. Abdomen in both sexes consisting of seven joints.

Example, Eurynome aspera. (Des.)

Description.—Carapace with the regions very distinct, rugose, with a great triangular tooth at the external angle of the orbit, and three or four smaller ones along the lateral border on the branchial region; movable stem of the external antennae very short, and its two first joints very small. Anterior feet tuberculous and slightly compressed, nearly straight in the female and with the pincer curved inwards in the male; succeeding feet rugose, and furnished with a crest, which is most marked on the third joint. Length about half an inch. Colour rosy, with bluish tints.

Locality.—The coasts of Noirmoutier and of the British Channel, at rather considerable depths.

Eurynome aspera. (Lambri.)

M. Milne Edwards refers to the Eurynome ecuasund (secuta) of M. Risso, from the Mediterranean, as having much in common with the species above noticed; but the details are not, in his opinion, sufficient to enable us either to refer it with certainty to this genus or to distinguish it from Eurynome rugosa.
contrary, very narrow; upper surface of the edge of the shell always more or less tuberculous or spiny. *Rostrum* small but rather advanced. *Eyes* perfectly retractile and orbits nearly circular, the walls of these cavities presenting a fissure above and a wide and deep gap below the internal canthus of the orbit. *The external antenna* bend back obliquely, and the fosses which lodge them are in general continuous with the orbits, for which it separates the internal angle of the lower orbital border from the front is far from being filled by the peduncle of the *external antenna*, whose first joint is extremely small and scarcely longer than it is wide; the second is more elongated, but never reaches to the front, and advances between the bacular joint of the internal antenna and the internal border of the lower orbit of the orbit; the third joint has its origin in the gap which occupies the internal angle of this cavity; and the fourth or terminal filament is very short. *The epistome* is but little developed and much wider than it is long; the pleurogastromion regions are small and nearly triangular. The external jaw-sets present nothing remarkable. The *sternal plastron* is much longer than it is wide. The first pair of feet are at least twice as long as post-frontal portion of the carapace, and often twice as much length; they extend to the right angle of each side of the body, do not differ sensibly from each other, and are always more or less triangular; the claw which terminates them is small and suddenly curved downwards and inwards, so as to form an angle with the rest of the hand. The succeeding feet are short and slender; their length diminishes, and their claws are never more than half as long as the first. The abdomen of the female presents nothing remarkable, but sometimes there are six instead of seven joints: in the male, the third, fourth, and fifth rings are more or less intimately blended, so that this part of the body is only composed of five distinct joints, and sometimes there are but four.

**Geographical Distribution of the Genus.**—The Mediterranean Sea and Indian Ocean, where the species live among the rocks at considerable depths.

§ A. Carapace nearly as long as it is wide.

* Carapace rugose, covered above with spines or tubercles.

*a.* Four first pair of feet having the third joint armed with spines.

**Example.** *Lambrus longimanus.*

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with large pointed teeth, and dentilated edges on the external border. There are some very short spines on the upper and lower borders of the third joint of the four last pairs of feet. Length about one inch.

**Locality.**—Pondicherry, Ambona, &c.

**Example.** *Lambrus angulifrons.* Length nearly as in *a.*

**Locality.**—Gulf of Naples and coasts of Sicily. *a.* Carapace nearly quite smooth above.

**Example.** *Lambrus Melasius.* Length about as in *a.*

**Locality.**—The volcanic rocks of the coasts of Sicily. *b.* Carapace much wider than it is long.

*Upper surface of the hands rough and spiny, which are more or less compressed, and so disposed as to form a crest.*

**Example.** *Lambrus echinitus.* Body covered with a down. Length about 10 lines.

**Locality.**—The coast of Pondicherry.

*b.* Upper surface of the hands more or less smooth and never with spiny spines; their upper and external borders armed with teeth, which are compressed, and so disposed as to form a crest.

**Example.** *Lambrus serratus.* Length nearly as in *a.*

**Locality.**—Indian Ocean.

Parthenope.

This genus, as limited by modern authors, consists of one species, distinguished principally by the disposition of the *external antenna*, whose bacular joint is not soiled to the neighbouring parts, but nearly reaches the front; at whose second joint, more than half as short as the first, is lodged in the gap of the lower orbital angle; the smallness of this gap, which makes the orbit communicate with the antennary fosset; the regularly triangular form of the carapace; and the existence of seven distinct joints in the abdomen of both sexes.

**Example.** *Parthenope hortensis.* Carapace pentagonal; than it is long, horizontal, strongly embossed, and suberculous above; rostrum short, triangular, and armed below with a strong interantennary tooth; orbits circular, with a fissure on the upper border; latero-anterior borders of the carapace very oblique, and armed with spines; anterior very large, of unequal size, and covered with large spiny tubercles; claws less compressed and less indented than in *Lambrus*. The four succeeding pairs of feet arise to the origin of the tarsus with sharp and very large spines, forming one row above and two below.

**Locality.**—Indian and Atlantic oceans.

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 Cryptopodia. (Edwards.)

M. Milne Edwards is of opinion that this singular genus establishes in some respects the passage from *Lambrus* to *Eisirha* (*Eisirha*); and, in fact, he observes, the form of its feet is the same as in the first; while the carapace presents, as in the last, lateral expansions which exceed above
these organs and hide them. Fabricius therefore placed these crustaceans among the Porcellanopus, Lamark among the Calappus, and Bosc both among the Calappus and Malus.

**Generic Character.**—Carapace slightly tumid, and in the form of a triangle, which is very wide, short, and rounded at the base; it is nearly twice as wide as it is long; but this great width does not depend on that of the body itself, but is due to the existence of the lamellar prolongation which surrounds the three posterior fourths of the dorsal buckle: behind, this prolongation extends far beyond the insertion of the abdomen; but it is especially considerable on the lateral parts, for there it forms an enormous vault on each side, which completely hides the four last pairs of feet. *Rostrum* triangular, horizontal, and rather advanced. Eyes very small, and completely retractile. *Internal antennae* like those of *Oderus*; their first joint quadrilateral and flat; the second rather longer, and reaching to the front; the third lodged nearly entirely in the slit which exists between the front and the internal angle of the lower orbital border; the terminal stem which thus springs from the internal canthus of the eyes is very short. *Epistome* rather wider than it is long; the second joint of the external jaw-feet terminating anteriorly by a nearly straight border; and the third, which is square, presenting forwards a notch which occupies its internal border rather than its internal and anterior angle, and which gives insertion to the succeeding joint. *Sternal plastron* much longer than it is wide. First pair of feet very large and nearly prismatic; in direction and form nearly the same as in *Lambus*. Four last pairs of feet very small, and nearly the same from foot to foot, they scarcely reach beyond the vault which covers them. The *abdomen* in the female consists of seven joints.

**Example.** *Cryptopoda fornicata.*

**Description.**—Carapace smooth above and dentilated on its borders; *rostrum* entire, as long as it is wide; anterior feet about once and a half as long as the carapace; their third joint very much dilated posteriorly, and armed with spines on the anterior border. Four last pairs of feet furnished above and below with a dentilated crest for nearly the whole length of their third joint.

**Locality.**—Indian Ocean.

The Parthians were evidently of Kusian origin. According to Justin (xli. 1) their name signified in the Kusian language 'banqueters in the desert,' and was subject to the Persian monarchy, and formed a satrapy together with the Chorasmians, Sogdians, and Arzis. (Herod., ii. 93.) In the army of Xerxes they marched together with the Chorasmians, Sogdians, Gandarians, and Dacians (Herod., vii. 67), and in that of the last Darius they were united with the Hircanians and Tapuri under one commander. (Arrian, iii. 8.) Under Alexander, Parthia and Hircania together formed a satrapy (iii. 22), which also appears to have been the case under the Syrian kings.

In the death of Alexander, the Parthians espoused the side of Eumenes, and afterwards became subject successively to Antigonus and the Seleucids, till about B.C. 256, when they threw off the authority of the Syrian kings and were formed into an independent kingdom under the rule of the Arsacids. (B.C. 256.) From that date the successors of Artaxerxes received the title of Arsacids. His reign was the beginning of the great Parthian empire, which was gradually increased at the expense of the Syrian kingdom in the west and the Persian in the east, till, at length, the Euphrates to the Indus, and from the Oxus to the Persian Gulf. In the time of Pliny (vi. 29) it was divided into 18 satrapies. The government was monarchical, but the kings were elected from the house of the Arsacids, and did not appear to have succeeded by the acknowledged principle, and we thus constantly read of pretenders to the throne. Strabo says (xii. 515) that there were two supreme councils, one consisting of kindred, by which he probably means the family of the Arsacids; and the other of wise men and magi, from both of whom the kings were chosen.

The Parthian empire lasted from B.C. 256 to A.D. 226. Its history may be divided into three periods:

**First Period,** from B.C. 256 to B.C. 130.—During this period the Parthians were engaged in continual struggles with the Syrian kings. Under Mithridates I., the fifth or sixth in succession from Arsaces I., the dominions of the Parthian kings were extended as far as the Euphrates and the Indus; and Demetrius II., king of Syria, was defeated and taken prisoner about B.C. 171. After his death was succeeded by Phraates II., whose dominions were invaded by Antiochus Sidetes, the brother and successor of Demetrius. Antiochus met with considerable success at first, and defeated several armies of Phraates; but he was afterwards cut off with his whole army, about B.C. 130, and the Parthians from this time entirely delivered from the attacks of the Syrian kings. (Joseph, xiii. 8; Appian, Syr., c. 68.)

**Second Period,** from B.C. 130-53.—During the early part of this period the Parthians were constantly engaged in wars with the nomadic tribes of central Asia, who, after the destruction of the Greek kingdom in Bactria, attempted to obtain possession of the western parts of Asia. Phraates II. and his successor Artabanus fell in battle against these invaders; but their farther progress was effectually stopped by Mithridates II. (B.C. 124-87), who met with however a powerful rival in Tigranes, king of Armenia. Tigranes obtained possession of some of the western provinces of the Parthian empire in Asia, and after his conquest by the Romans, after the end of the Mithridatic war, the Parthians again acquired their former power, and were brought into immediate contact with the Romans.

**Third Period,** from B.C. 53 to A.D. 226, comprising the wars with the Romans. The invasion of Curasant during the reign of Orodus terminated in the death of the Roman general and the destruction of his army, B.C. 53. (Curasant.) In consequence of this victory the Parthians obtained a great increase of power. They invaded Syria and the following...
over the conquered territory was given up, and the Em-
phrates again became the boundary of Parthia. The
nations remained at peace with one another till the reign
of M. Aurelius and L. Verus. The general of Verus
met with great success in the war, and at length took
Nero, who had been captured with the help of Seleucia on the Tigris (A.D. 165). Under the reign of Vologeses IV., the Parthian
dominions were invaded by Septimius Severus, who took
Ctesiphon and several other important towns, A.D. 197, and
was annexed to the Roman empire the important province
of Mesopotamia, including the country of the Bar- 
callae who followed the successes of his father A.D. 217 (Bar-
calae): and though his successor Mammernus made a
degraceful peace with the Parthians, their power had been
greatly weakened by the conquests of Verus, Severus,
and Septimius Severus. The Parthian power was never more
established in the Parthian empire, which is usually known
by that of Tigranes II. of the Sassanian dynasty.

PARTICLE (in Grammar), the name of one of the
parts of speech into which grammarians have divided
the words of a language. The word 'particle' comes from
the Latin particula, and is derived from the Latin analogy as mancipium and princeps, and means a
partly 'part-taking.' It is said, according to the old
grammarians, to have obtained this name in consequence of its
partaking of the nature both of the verb and the
noun, hence a word which is generally regarded with great
respect in the Sanskrit; and in the Greek, as retorq-
vis; in the Latin, as regent-is; and end in the German, as
lieb end. The term present participle is however not
very correct, as it often denotes the continuation of an
act in a state of being independent. This was called readily res is;
the participle is called by some grammarians the active partici-
ple, and it is also passive; thus in the expression he was
building the house, the participle is active; but when we
say the house was building, it must be regarded as passive.
This ambiguity in the use of the participle in Eng.
slang has led to the modern practice, when a
participle has the meaning of expressing a state of
existence, of expressing by means of the present participle of the
verb to be and the past tense of the verb which is to be employed
as being loved, being praised, etc., which expression must
in certain very awkward and unwarranted by the usage
of our best writers, if they are not absolutely misled.

The other participle in English is used to denote
past time, and is generally formed by adding en or ed, as
brok-en, praise-d, etc.

PARTICULAR, which is derived from a Latin word (par-
cula) meaning a small part, is a term employed in
grammar, but with rather an uncertain signification. Some
of the old grammarians included under this name all the
parts of speech except the verb and the noun, namely, prepositions,
adjectives, articles, relative pronominal adverbs, adjectives,
and adverbs, of which the class is included under the term of 'particles'
by the Arabic grammarians. According to this definition, as
words as vehementer, unexpectedly, etc. would be
considered particles, which is certainly contrary to the common
usage, by which these words are often attached to a
noun, as if they were regarded as particles all those small words which serve
make the sense of a proposition more clear and precise,
though they might sometimes be omitted without rendering
the meaning unintelligible. To this class of words belong
the Greek έν, ὰν, τοί, ές, καί, καί, etc., the English truly, still,
now, etc.

PARTITION. [Parceners.]

PARTITION TREATIES were two treaties concluded in
the reign of William III. of England for regulating the

succession to the dominions of the crown of Spain, to each of which his king was a principal party. The war with France, which had lasted since May, 1689, having been put an end to by the several treaties of peace signed at Ryswick by France, England, and Holland, on the 10th of September, 1697, and by Germany on the 30th of October following, the apparently fast approaching death of Charles II, king of Spain, threatened to give to the new general war if the succession to his dominions should not be provided for. The news reached Holland on the 18th of October, and the Dutch had given in their resignations. Charles had no issue either by his first wife, Maria Louisa of France, who had died in 1690, or by his second wife, still surviving, the palatine princess Marianne of Neuburg, of no prospect of having any. Nor had he any legitimate heir. Of his illegitimate children, one, Philip, married to Louis XIV. of France, had died in 1683, leaving a son, Louis, styled the Dauphin; the younger, Margarita Theresa, who died in 1673, had left by her husband, the elector of Bavaria, a daughter, Maximilian Emanuel, elector of Bavaria, and she having also died in 1692, her heir was her son, the electoral prince Joseph Ferdinand. Maria Theresa however had on her marriage expressly renounced for herself and her posterity all right in Spain, and she had even expressed as to the validity of that renunciation, either in France or in Spain. Maria Antonietta had also on her marriage made a similar renunciation; but her act had never been confirmed by the king or Cortes of Spain, and was consequently not acknowledged by that kingdom. Her son, the electoral prince, therefore was commonly looked upon in Spain as the rightful heir of his grandfather; and this was also the view taken by Charles II. himself. It was not that however of the prince's grand- father that the negotiations for the transfer of his house and hons of his own to the Spanish succession, had compelled his daughter to renounce her maternal inheritance; and these pretensions he now brought forward in opposition to those of his grandson. He claimed both as the true heir of Philip IV., and the only legitimate heir of Charles II. His daughter therefore, and his heir through her, was more acceptable to the Spanish nation, and his claim was more powerful in the eyes of the French monarch, through a genealogy which we need not stop to trace; and more especially as the nearest male heir of Philip III. of Spain, the grandfather of Charles II. Through his mother Maria, who was daughter of Philip III. This explanation will make sufficiently intelligible the arrangements of the two Treaties of Partition.

The first was signed at the Hague, by the plenipotentiaries of England, France, and Holland, on the 11th of October, 1697; and its general scope was the total and entire renunciation of the death of Charles II., the reigning king of Spain, without issue, the dauphin of France should have, in full satisfaction and extinction of his claims upon the Spanish succession, the kingdoms of Naples and Sicily, Sancro Stefano, and by any other right which he or his issue might claim through them; Sicily then held by Spain, the town and marquisate of Fines, and the province of Guipuzcoa (with the exception of any places therein which might be found to lie beyond the Pyrenees); that to satisfy the claims of the emperor, the duchy of Lorraine, a daughter of Louis XIV., styled the archduke Charles; and that, with these exceptions, the crown of Spain, and all the kingdoms, islands, states, countries, and places then depending thereon, should be given and assigned to the prince, eldest son of the elector of Bavaria; his posterity for ever. The future extent of the Spanish dominion, was limited to Spain, the Netherlads, and America. It was intended that this arrangement, which was made with the greatest privacy, should be kept a secret from the court of Madrid; but that the secret should not be so strictly kept, as that a public declaration should not be made of it (properly through the French king); the consequence of which was that Charles, in the indignation and unsworn vigour to which he was roused, made a will, naming the electoral prince of Bavaria his heir. Every provision and care was taken to conceal this. February 2nd, 1699, the electoral prince died, in his eighth year—poisoned, as his father did not hesitate to assert, by the contrivance of his own grandfather, the emperor. On this was arranged and concluded the Second Partition Treaty, between the same three, or rather two, parties; the league of August the 1st, 1696, having been dissolved. By this compact, which was signed at London, on the 3rd of March, 1700, the crown of Spain, with the territories for- merly allotted to the dauphin, were assigned to the archduke Charles of Austria; and the dauphin was to have the same share as before, with the addition of the dukeries of Lorraine and Bar, which the duke of Lorraine was to be obliged to quit and exchange for the dukies of Milan. In his intrigue at the court of Madrid however Louis XIV. had not foreseen how great might be the extent of his heir, the second son of that prince, Philip, duke of Anjou, if he could secure for him and his descendents the entire Spanish succession. At last, on the 2nd of October, this same year, the feeble and long-waving Charles was carried to his death by a fit, and he died on the 3rd of November following. The duke of Anjou was immediately declared by his grandfather king of Spain and the Indies, by the name of Philip V.; and the contest between him and Charles of Austria, or, as he called himself, Charles III. of Spain, was decided in his favour, which was only terminated by the peace of Utrecht, in 1713.

PARTNERSHIP may be defined to be a contract between two or more persons for joining together their goods, money, or other property, upon an agreement that the gain or loss shall be divided between them; and its object must be some legal trade or transaction. The English law of partnership is founded on the common law, the so-called law of merchants, and the Roman law. By the common law a partner is only co-partner by fact, and his co-partner by deed. By the law of merchants he has power to bind his co-partner by a bill of exchange, and there is no survivorship in the partnership stock. From the Roman law is derived the principle that a partnership is terminated by the death of a partner. If the judges have any doubt about the custom of merchants, they may send to them to know their custom, as they may send for the civilians to know their law: but the judges only recognise those customs of merchants that are general, not those of particular individuals.

We shall first speak of private unincorporated partnerships, to constitute which no writing is necessary. The acts of the parties, when there is no partnership contract in writing, are the evidence of the contract. Partners may be either natural, or artificial persons. An artificial person appears to the world as a partner is an ostensible partner. An ostensible partner may or may not have an interest in the concern; if he has no interest in the concern, but allows himself to be known as an partner of the firm, he is a nominal partner; if his name and transactions are purposely concealed from the world, he is a dormant partner. But if his name and transactions are actually unknown to the world, he is more properly termed a secret partner. Every partnership, whether in the hands of a natural person, or an alien enemy, cannot be a partner with a person in this country; at least he cannot sue in this country for a debt due to the firm. Married women are legally incapacitated from entering into the contract of partnership; and although they are sometimes, under some covert by which they are entitled to shares in banking-houses and other mercantile concerns, yet in these cases their husbands are entitled to such shares, and become partners. If parties share in the profit and loss, they are partners, although one of them be inglorious, and a third who has not contributed to his advantage. It may however be avoided by him on coming of age, though the person with whom he contracts will be bound. An alien friend may be a trader and sue in personal actions, and may therefore be a partner. But an Eng- lishman who is a merchant in a foreign country, or an alien enemy, cannot be a partner with a person in this country; at least he cannot sue in this country for a debt due to the firm. Married women are legally incapacitated from entering into the contract of partnership; and although they are sometimes, under some covert by which they are entitled to shares in banking-houses and other mercantile concerns, yet in these cases their husbands are entitled to such shares, and become partners. If parties share in the profit and loss, they are partners, although one of them be inglorious, and a third who has not contributed to his advantage. It may however be avoided by him on coming of age, though the person with whom he contracts will be bound. An alien friend may be a trader and sue in personal actions, and may therefore be a partner. But an Eng- lishman who is a merchant in a foreign country, or an alien enemy, cannot be a partner with a person in this country; at least he cannot sue in this country for a debt due to the firm. Married women are legally incapacitated from entering into the contract of partnership; and although they are sometimes, under some covert by which they are entitled to shares in banking-houses and other mercantile concerns, yet in these cases their husbands are entitled to such shares, and become partners. If parties share in the profit and loss, they are partners, although one of them be inglorious, and a third who has not contributed to his advantage. It may however be avoided by him on coming of age, though the person with whom he contracts will be bound. An alien friend may be a trader and sue in personal actions, and may therefore be a partner. But an Eng-
them. It is not necessary that the division of profit and losses should be such as to make it sufficient that the parties share the profits, in order to render them partners. If they share the profits, they are by consequence bound to share the losses. But to constitute a man a partner on the ground of sharing profits, he must have an interest in such profits, and not only receive a portion of the profits, by way of payment for his labour, trouble, or skill as a servant or agent of the concern, he is not a partner. Factors and brokers who receive a commission out of the profits of goods, are not on that account partners with their principals; nor are persons who receive a certain share of the profits of an adventure, as payment in lieu of wages for acting as servants, partners in the adventure; nor even are persons who receive wages in proportion to the profits of the undertaking considered as partners. If a person lend money to a firm, and receives an annuity or interest, certain as to amount and duration, he is not a partner; but if he were to receive an annuity in lieu of the profits of the trade, and determinable on the event of the trade ceasing, that seems that he would be considered as a partner with the grantor of the annuity; or if he received an annuity varying in amount with the profits, he would be clearly a partner in the concern.

A partnership must be formed for the purpose of some lawful trade, business, or adventure. If the subject of the contract be illegal, there can be no partnership founded upon it, so as to give the contractors a remedy against each other, or against third persons, at law or in equity. There can be an illegal contract of partnership, which is not executed, but executory only, none who are parties to it can by action or suit recover the money advanced for the purpose of establishing the partnership. A contract originally entered into for the purpose of evading the usury laws, and not founded with the want of partnership, cannot be supported as a legal contract: nor can a partnership be considered a lawful one, where two or more persons, as partners in a disorderly house, or robbing on the highway, or for acting within such distance from London as is forbidden by statute.

A person may stipulate not to be a partner, but if he shares the profits with those with whom he stipulates, he becomes a partner as far as relates to his liability to a third party. And if persons be known to share the profits of a trade, it is presumed that they are partners, and as such, liable to all persons who deal with the firm, whatever be the private agreement among themselves. But there may be such a partnership by showing that the legal relation of partnership among themselves does not exist. If a person allow his name to be used in a business, or in any other way consent to appear as a partner, he will be so considered with respect to other persons whatever may be the wishes of the firm; and he will be equally responsible to third parties with the other partners, although he may not receive or be entitled to receive any of the profits. The ground of this rule of law is clear and reasonable: a person must be considered bound by a contract, if he act in such a way as to make other contracting parties believe that he is a party to the contract; and such is the case with a man who allows his name to appear as a member of a firm, as to all contracts and debts which are necessary for carrying on the business of the firm.

A partnership at will is one which continues as long as the parties live and are able and willing to continue it: a partnership for a fixed term continues for the term if the parties intend it, and if there be no legal incapacity, and the partnership at will may be dissolved at any time by the expressed will of any member of it, a rule which is derived from the Roman law, and which is a necessary consequence of the nature of the partnership contract. In such case the partnership is dissolved immediately upon notice, and to have precise accounts, and to have them always ready for the separation of his co-partner. Each partner is liable to the performance of all contracts of his co-partners, in the same manner as if entered into personally by himself; and as to the objects of the purposes of the partnership. If the parties to the contract of partnership do not regulate it by express stipulation amongst themselves, the contract, with its duties and other
gations, will be implied and enforced by the rules of law applicable to persons in such relative situations; and where the contract does not reach all the duties and obligations, such omissions will be supplied by the same rules of law.

Though partners may have entered into a written agreement whereby they bind the firm by contracts relating to the partnership, and he can do this by mere verbal or written agreements, or by negotiable securities, such as bills of exchange and promissory notes. One partner may pledge the credit of the firm to any amount; but there are some exceptions to this rule. A dormant partner cannot bind the firm during the time that he is actually a partner; and a nominal partner is in the same manner liable during the time that he holds himself out to the world as a partner. Parties must make no arrangements among themselves which will limit or prevent their ordinary responsibilities to third parties. The power of one partner, above alluded to, to bind his co-partner, is implied in law, and not by express authority from the latter being necessary for that purpose; and in the case of third parties, it exists by custom which has been judicially recognized. A partner may give a guarantee for himself and his partners, and the firm will be bound by it, if it be made in a matter relating to the partnership. The act and assurance of one partner to business done on his own account, or without the introduction into partnership affairs, whether the party applying for a receiver wish a continuance or dissolution of the partnership, he must make out such a case to induce the court to interfere, as would authorize a decree for a dissolution.

Generally speaking, one partner has an implied authority to bind the firm by contracts relating to the partnership; and he can do this by mere verbal or written agreements, or by negotiable securities, such as bills of exchange and promissory notes. One partner may pledge the credit of the firm to any amount; but there are some exceptions to this rule. A dormant partner cannot bind the firm during the time that he is actually a partner; and a nominal partner is in the same manner liable during the time that he holds himself out to the world as a partner. Parties must make no arrangements among themselves which will limit or prevent their ordinary responsibilities to third parties. The power of one partner, above alluded to, to bind his co-partner, is implied in law, and not by express authority from the latter being necessary for that purpose; and in the case of third parties, it exists by custom which has been judicially recognized. A partner may give a guarantee for himself and his partners, and the firm will be bound by it, if it be made in a matter relating to the partnership. The act and assurance of one partner to business done on his own account, or without the introduction into partnership affairs, whether the party applying for a receiver wish a continuance or dissolution of the partnership, he must make out such a case to induce the court to interfere, as would authorize a decree for a dissolution.
dered to be that the joint debts should be satisfied out of the joint estate; if that were insufficient, then subject to the claims of their separate creditors out of their separate estates proportionally; and if any of them were insolvent, then out of the remaining separate estates proportionally. But the case of Dewey v. Noble (1 Mer. 529), since affirmed on appeal by Lord Brougham (2 R. & M. 426), has established the principle that a partnership contract is several as well as joint; and that a joint creditor may have a payment to the estate of a deceased partner. And the same judge (Sir W. Grant) who decided that case, declared that a partnership debt has been treated in equity as the several debt of each partner, though at law it is treated as a joint debt of all. But this decision amounts to a more advantageous remedy against his estate than he would have had against his separate estate if living. But it seems doubtful whether this point can be considered as finally settled.

It has been before said that notice of the decease of a partner to the creditors of the firm is not necessary to free his estate from future liability; but it is otherwise if one of the surviving partners be executor of the deceased. A decree of administration names director of the deceased; in that case his estate will be liable to the extent to which he directs his assets to be employed. If the executor exceed that limit, he becomes personally responsible.

In actions by partners, all the partners may, and all the insolvent partners must, join as plaintiffs, unless the contract upon which the action is brought be in writing under seal, when only those partners who are included can sue thereon. If such a contract is not under seal be made for the benefit of themselves and others, those for whose benefit it is made, as well as those whose names appear in the contract, may sue. Parties to a legal partnership cannot recover upon an illegal contract, although it be legally performed, at the time when it is made, made, nor only known to one of the members of the firm. Persons who may legally be partners in foreign countries, as husband and wife, cannot sue here as partners, for by the laws of England husband and wife are not permitted to sue as partners. On the other hand, a person acting under an apparent authority, such as to make a partnership here, may sue as partners for consignments sent to this country, through they cannot sue as partners at the place of trading by reason of the particular law of that place. The construction of contract is under English law, and the laws of the place in which they are made; but remedies must be pursued by the means pointed out by the law of the country whose tribunals are appealed to. The laws of the country where the contract was made can only have a reference to the nature of the contract, but not of the trade of enforcing the partnership. In the case of a partnership, a misjoinder of parties may be occasion to prefer an indictment relating to the partnership property; such property may be stated in the indictment as belonging to one of them by name, and to another or others, as the case may be. But though it is not necessary to name all the partners, yet it is required for the purpose of the partnership, that fact should appear in the indictment, or the prisoner must be acquitted.

A whole firm may become bankrupt, or some or one only of the partners may become so, whilst the remaining members may be solvent; but those only of the partners who have committed acts of bankruptcy are to be deemed bankrupts; and to constitute two or more bankrupts under a single flat, there must be evidence of joint trading. Upon the bankruptcy of one of the partners, the bankrupt's property in the hands of the assignees, who have the same remedy by action for the recovery of the debts due to the bankrupt, and for the redress of all civil injuries with respect to the property passing to them under the flat, as the bankrupt would have had if no flat had been entered. When the bankrupt's property is sold, the solvent partners join with the assignees in an action for the recovery of the joint debts. On the bankruptcy of one partner, the solvent partners become tenants in common with the assignees of the partnership effects. Upon the bankruptcy of one partner, under a separate flat issued against him, his assignees take all his separate property and all his interest in the joint property; and if a joint flat issue against all, the assignees take all the joint property, and all the separate property of each individual partner. Joint estate is that in which the partners are jointly interested for the purposes of the partnership at the time of the bankruptcy. Separate estate is that in which the partners are each separately interested at that time. Joint debts are those for which an action, if brought, must be brought against all the partners constituting the firm; in all cases there held, when a partner becomes liable for a debt contracted by his co-partners, a joint debt is created, and the creditor is a joint creditor of the firm. Separate debts are those for which the creditor can have his remedy at law against that partner only who contracted them.

Specific Partnerships, Joint-Stock Companies, Banks, Mines, and Ships.

Joint-stock companies are such companies as are unincorporated, and which are called joint-stock. All trading associations, however numerous, and although unsupported by charter or act of parliament, are legal, provided their purposes be legal, and provided they do not attempt to exercise the privileges of a corporation, such as the power of raising money, or by their own means of lending money. If a man executes the deed of settlement of a company or association of individuals, or by his letters or admittance, it can be proved that he was really a partner according to the terms of that deed; or if he be proved to have done acts which are fraudulent or unfair, he is as such taken into account as a partner and his interest to be reduced to the value which it would have out himself to the world as a partner, he is legally a partner in the company. The most conclusive evidence of partnership is the signing of the deed of settlement. But the signature of any person in prospect of an appointment, joint stock company does not make a man liable to third persons.

The partners in joint-stock companies are of two classes: one consists of directors, trustees, and others who are actively employed in conducting the concern; the other, a number of persons who take little or no part in its management, and many of whom become shareholders for the sake only of a profitable investment of their money. The general conduct of the trade falls upon the directors, while the more particular transactions are usually managed by the other partners or agents who are not regular partners. The funds and other property of the company are vested in the trustees. The deed of settlement is a covenant made between a few of the shareholders chosen as trustees for that purpose, and the others; by which each of the latter covenants with the former to pay annually to the trustees, for the use of the shareholders, for the due performance of a series of articles which are specifically set forth, and which provide: the duties of the trustees, directors, and auditors; define their powers, and all other necessary matters. In all these matters, so far as the interests of the company are not, the general law of partnership prevails. Unless therefore there be a stipulation to the contrary, every proprietor has a right to have free access at all times to the books of the company.

Particular nature of partnerships that a partner cannot assign his interest so as to make a stranger a partner. In order therefore that the shareholders of a trading company may be able to do this, there must be a provision to that effect in the deed. But as these shares cannot be legally assigned, it is necessary that all those who have the benefit of the deed be inserted in the deed for giving due notice to the directors of the intended transfer or assignment. If a party have signed the deed wishes to retire from the concern, he must conform to the stipulations of the deed, which usually provides that any partner shall not be permitted to retire without the payment of a certain sum in respect of his share, and upon giving notice to the directors. The legislature or next of kin of a shareholder become beneficially entitled to his interest and upon the death of any partner they may, unless the other partners' or administrators will be entitled to stand in his situation as a partner, unless permitted to do by the deed of settlement.

The private property, to its full extent, of every member of an unincorporated firm is subject to the judgments of all the debts of the company. The most important object to be gained by an act of parliament for a joint-stock company is by the clause which enables it to sue and be sued through the medium of one of its officers; with which advantage the difficulties attending the suits of such companies are beyond calculation. The Court of Chancery however seems inclined to diminish the difficulties, for 'that the Court will not, by the directors of a joint-stock company on behalf of themselves or all other shareholders, relieve the benevolent agreement by an agent of the company, it is
PASSEI.A. The capital of the Venetian republic, on the north coast of Italy, is built on a series of islands in the Adriatic Sea. It is connected by bridges with the mainland and has a population of about 140,000. The city is famous for its beautiful Venetian architecture, including the Doge's Palace, St. Mark's Basilica, and the Grand Canal.

PASSIFLORA, or PASSION-FLOR, a genus of flowering plants in the family Passifloraceae. The genus is characterized by its showy flowers, which are often yellow or white, and their long, narrow sepals and petals. The fruits are usually large, juicy, and edible. The genus is native to the Americas, with many species found in Central and South America.

PASSIONFLOWER, a common name for plants of the genus Passiflora. The flowers are typically showy and have six petals, each with a特色纹饰。The fruits are usually large, juicy, and edible. The genus is native to the Americas, with many species found in Central and South America.

PASCAL, Blaise, a French mathematician and philosopher, was born in Clermont, Auvergne, in 1623, and died in Paris in 1662. He is known for his contributions to mathematics, including the theory of probability and the development of the binomial theorem. He also made significant contributions to the philosophy of science, particularly in the areas of epistemology and metaphysics.
### Table: 2010 Census Summary File 1 (SF 1) 3-7

<table>
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<th>County</th>
<th>2010 Population</th>
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<th>2010 Median Income</th>
<th>2010 Unemployment Rate</th>
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Notes:
- The table above provides a summary of the 2010 Census data for various counties.
- The data includes population, housing units, median income, and unemployment rate.
- The figures are rounded for ease of reading.

PASTES. [Glass, p. 256.]
PASTO. [Granada, New.]
PASTOR [Ornithology]. [Sternidae.]
PASTORAL (from the Latin pastor, a shepherd or herdman), is the name given to poems which are descriptive of thumerby the country life, or to dramas in which the characters represent shepherds or other country-people.
[Bucolic; Idyll.]

Pastoral letters are circulars addressed by a bishop to his diocesan for purposes of religious instruction or admonition, in the words of discipline. This name also is derived from 'pastor,' the bishop being styled the shepherd of his spiritual flock.

PASTURE LAND. There are tribes which have no other occupation than that of pasturing domestic animals, and in which the land can often be purchased, or at least, rent to a definite owner. Where the climate is genial, and the extremes of heat and cold are unknown, cattle are fed all the year round by moving from one place to another. In such a state are some of the wandering tribes of Asia, who have no fixed habitations, but pitch their tents wherever pasture is abundant, and move them to another spot as soon as it is consumed where they are. In civilised countries, where the land is divided and appropriated, such a system cannot exist; though there are still traces of it in this country, as we see in the remaining waste lands, on which there is a right of common.

The pasturage of cattle is now a part of regular husbandry; the land which affords the herbage for cattle forms part of the system. Pasturing is paid for in the same manner as for the introduction of a new system. Pastures are now fenced and protected, and pains are taken to improve them, so as to maintain many more cattle or sheep than they would in their natural state. We shall not here speak of rich grass lands only, but of those which are commonly called grazing land; nor of artificial pastures, which form portions of arable farms, and have been depauperated only to enrich them and make them more fit to produce corn when again submitted to the plough. But we shall consider this a part of the subject which gives frequent opportunity of driving the sheep to sheltered situations, as well as the chaff hills, when in general hospitality, and is therefore not of immediate importance.

There is another kind of pasture in England on the chalky hills which are called downs, where useful and Hardy sheep are reared. Here the exposure is less, and the proximity to the sea gives frequent opportunity of driving the sheep to sheltered situations. The chalk hills is in general very fine and short, and the quality is very good. The soil is only a few inches deep, but it has been enriched by the dung and urine of sheep from time immemorial. In these situations, the options are more or less a mixture of crottle or cutting and vest some portions of these pastures to tillage: but it is not often an advantageous speculation. A few crops may be obtained at first; but the thin layer of rich earth, which is at the surface, is soon exhausted, and nothing remains but barren chalk. No one can rear the fine turf which had been produced by ages of pasturage.

To those who have extensive pastures it is of great consequence to ascertain whether oxen, heifers, cows, or sheep are the most profitable, and of these, what breeds suit the situation, climate, &c, and whether the climate is to be kept. This mode of reckoning is much fairer than by mere extent of surface.

In many places pasturing has been found much more productive than cultivation; and some large proprietors have converted great tracts of land from arable into pasture farms. In such cases the improvements of pruning and tilling may be necessary; but the pasturing is very scanty, and where the soil and climate do not tempt men of capital to settle.

Considerable improvements have been made in natural pastures, not only by the raising of banks and stone walls as in the case of Turk lawns, but by the use of the water of a stream, which has often been found to be of great service in clearing and draining and clearing the surface of wild plants and shrubs; which prevent the herbage from springing up, and greatly diminish the feed. On the sides of steep hills, where springing is this break or an objection, large and swampy depressions have been made and carried off the water and laid dry the pastures below them; while reservoirs have been constructed in many places to receive the water and to supply the stock in dry weather. On pesty mors the application of lime to the extent of 100 has often produced wonderful effects, and made various kinds of clover and grasses spring up which were never seen on the spot before.

Those who are possessed of extensive pastures often look upon them as of too little value to lay out any money in their improvement; and unless when an attempt is made to bring them into regular cultivation, which often fails after a great outlay of money, they are not worth the slightest attention. Yet many rough hills pastures might be doubled and tripled in value merely by clearing the surface, burning coarse grasses, rushes, ferns, and furze; and sowing a few seeds of cereals there the ashes of the bracken. The additional number of cattle or sheep which can be kept on this improved land, would surprise any one who had not had experience of such improvements. The formation of convenient channels for the water to run off is another important object, and especially so that even as small fields may be made to dry up; and a loose surface laid dry by this means may be much improved, by merely burning the heath which grows upon it. After the fire has scorched the ground, grasses will spring up spontaneously; and, at a very small expense, a considerable tract of mountain pasture may be converted from the state of a brown heath or moor to that of a fine green sward.

Wherever there are large pastures, proper and suitable buildings made of substantial materials should be erected. The cattle should have numerous sheds for refuge in bad weather, and especially so that they may have a dry and sheltered situation and shelter. Warmth is in some cases of more importance than food; and an animal exposed to all the severities of a northern climate requires more food to keep him alive, than when he is kept warm and protected from the immediate influence of the cold and cutting wind.

Very poor pastures on sandy or gravelly loams is of very little value to the proprietor; where the situation allows of such land being converted into plantations, it will generally be found most advantageous to do so, but if there are not the same advantages by ploughing, raising, and draining, they may often be converted into good arable farms. A great part of Norfolk, which now bears excellent crops of barley, wheat, and clover, was once only poor sandy pasture, where the chief income to the proprietor arose from rabbit warrens. We have not determined the real capabilities of a soil by the natural grasses which grow upon it, before it has ever been stirred and cultivated. When loamy sand or gravel is left in a hard condensed state, it will be very little improved by ploughing, raising, and draining, it has been broken up deep, and trenched and improved by lime; and occasionally it has been made very useful land. The same may be said of cold wet pastures on a stiff clay. The water checks the roots of the better sort of grasses, and nothing thrives in such pastures except rushes and very coarse grasses; probably these they

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have been carefully drained — when the surface has been pared and burnt, and the ashes spread over the land — a very material improvement takes place, whether it be left unbroken, to produce herbage, or be improved by a course of judicious cultivation, and laid down again to grass in a clearing. [Grass on state : it either case, the pasture, from being of little use, and perhaps dangerous for sheep, which are apt to rot there, becomes sound and good, producing excellent nutritious herbage, and will continue so ever after.

When the soil is naturally deep and of a good quality, but the situation renders it not advisable to convert the pastures into permanent arable land, and the herbage has been deteriorated and overrun with moss or weeds, it is a very effective mode of improving the pasture to plough up the soil, to some depth of tillable bottom, to level the field, and to scatter the seed on the surface or in inches, so as to give it the appearance of a fallow field. When it is well pulverised and barrowed level, the seed, which has been taken off small pieces by the spade, and scattered over it; and after a shower has somewhat moistened the surface, it is well rolled with a heavy roller. Thus the moss is effectually destroyed: the root-weeds have been eradicated, and the fine grasses, which are short and brown, are permitted to grow. They will soon strike into the loosened soil, and a fine close sward will be the result. The improvement is still greater if lime is put on the land before the spreading of the seed, and if at the same time some of the best grass seed is put on. This practice is, at all times, very beneficial, and when for the reseeding the soil is after harvest, and no cattle be admitted till the next spring.

Pastures are seldom improved with manure, which is generally reserved for arable land, or grass land intended to be brought into a more improved state by cultivation. When, however, it will well repay the expense of manuring, especially with liquid manure, the drainage of ditches and ditches and the urine of cows and horses, which is collected in a tank when they are kept in stints. Pasture manure is very useful for raising grass and improving the sward. The grasses and the hay are said to have the same effect. When it is intended to convert land which has been in a state of health or waste, covered with fern, bracken, or other rank vegetation, into pasture, it is indispensable to begin by a course of arable cultivation; and it is only when the soil has been brought into an improved state by tillage and manuring, and all the roots and seeds of noxious plants have been eradicated, that grass seed may be sown with any prospect of a good sward. Most of these soils are poor and sandy, and not very favourable to the growth of good grass. In this case the safest mode of converting the land into pasture is by inculcating it with pieces of sods taken from a good rich pasture. By this means the main substance of the soil, being unaltered, is left to the depurating with sheep only, very good pastures have been produced on very poor soils; and if in the course of a few years they should degenerate, they may be profitably broken up and cultivated on the convertible system of husbandry, after which they may again be improved for a certain number of years. Wherever the soil consists of a sandy or gravelly loam, this system is the most advantageous.

In the richest pastures, such as those of Lincolnshire and other growing districts, there will manure very fatal effects of 60 or 90 stone, and sometimes keep several sheep in store order besides. There is a marked difference between land that will fatten an ox, and that which will only rear him. This can scarcely be discovered by simple examination of the land; but it may, in part, be explained by experience. The appearance of grass has more proof, as it is called, in one place than another. The bite may be very short and the pasture appear bare, and yet the value of it may be seen on the ribs of the cattle. Much of the skill of a farmer in this art consists in knowing how to advance his stock and his land. He should know the power of every portion of it, and stock it so that the grass may not grow faster than it can be cropped by the cattle or sheep, and that the animals may always have the full quantity required. Every animal wants a certain quantity of food to repair the daily waste occasioned by the animal functions. If he has no more, he makes no progress: the more he can convert into flesh and fat beyond this quantity in a given time, the more profitable he will be. Hence the superior qualities of some animals with respect to this point indicate the superiority of their breed, and afford the greatest net profit to the grazer. In the same pasture one beast or sheep will give a reasonable profit, while another may occasion an actual loss. The adaptation of the stock to the nature of the pasture is consequently an object of the greatest importance, and requires much judgment and experience.

PASYTHEA, the name given by Lamouroux to a group of Linnean Sertulariids. [POLYPMIA MUSCULARIS] PATAGONIA, a country in South America, comprehending the most southern portion of that continent. It includes a large part of the southern provinces of Chile and Argentina, and is separated from the southern provinces of Peru by the Pacific Ocean. The land which the Spanish conquistadores first discovered was the part now called Patagonia. The name, derived from the Indian Patagones, signifying aboriginal tribes. From this new boundary, the most northern point of which is near 36° 50' S. lat., Patagonia extends southward to the Strait of Magalhães by which it is divided from the South American continent and of Patagonia is Cape Froward, near 53° 35' S. lat. and 71° 25' W. long. On the east Patagonia is washed by the Atlantic, and on the west by the Pacific Ocean. The line which divides it from Chile is not precisely fixed, but it is generally considered that the Strait of Balsan, and the Reclusoni Sound and Reclusoni Inlet (between 41° 30' and 42° S. lat.), which constitute the innermost recess of the Gulf of Ancud, which separates the island of Chiloé from the continent. Farther north the Andes constitutes the boundary between Patagonia and Argentina. In the interior, the state of Patagonia exceeds 276,000 square miles, or is about 75,000 square miles more than that of France.

Patagonia comprehends two regions, which differ from one another in nearly every respect — the eastern and the western plains. The mountain-region occupies the countries extending along the shores of the Pacific and the western portion of the Strait of Magalhães. The plains occupy the eastern part of the country, stretching out along the Andes and the good pasture of the Magalhães. The mountain-region comprehends the southern portion of the Andes. This extensive mountain-chain begins near 52° 10' S. lat., on the northern shores of the inlet called Ancón sin Salida, or Sound without Outlet. That port, near the Peruvian coast, is the only point that has been considered as an appurtenance of the chain, but not as constituting a portion of it, for it is divided from it by a deep arm of the sea, and also intersected by another channel.

It is a remarkable and characteristic feature of the southern part of Patagonia that the waters of the Andes, issuing through a long and comparatively narrow inlet, which extend to the plains east of the mountains, and there expand into large salt-water lakes. The southern part of these lakes or inland seas may be compared to the Mediterranean, as consists of two basins united by a narrow channel of moderate extent, and connected with the Strait of Magalhães by a strait of larger dimensions. The last-mentioned strait, called Jerome Channel, branches off from the Strait of Magalhães near 52° 15' S. lat. and 72° 30' W. long. It is about 12 miles wide, and continues eastward with a gentle bend to the west to 53° 14', where it turns north-east, and gradually widens into Otway Water. It is upwards of 30 miles long, and generally two miles wide. Otway Water, the southern of these inland seas, is about 30 miles long and 2 miles wide, as it proceeds eastward. Near Jerome Channel it is hardly six miles wide, but towards its eastern extremity above twenty. Its length is probably 50 miles; the eastern extremity however has not been explored. The navigation of Otway Water has always been considered as a subject of the strong tides-currents and gales. Not far from the north-eastern extremity of Otway Water, a narrow winding channel runs north by west to another inland sea-basin. The channel is called Fitzroy Passage, and the basin Skye Water. Fitzroy Passage is about 15 miles long and 5 miles wide, and extends anywhere above half a mile wide, but it has depth enough for the largest vessels. It enters Skye Water at its most eastern extremity. The last-mentioned inland sea-basin extends from the northern entrance of Fitzroy Passage westward about 60 miles in length, varying in width between.
6 and 5 miles. It contains a number of rocky islands, among which that called Dnynevor Castle rises to a consid-
erable elevation.

The northern

8

island sea in form bears some resemblance to the Baltic. The main body is of comparatively small extent, but it sends out several branches, which advance to a considerable distance inland. This sea has not yet received a proper denomination, and we shall name

it Kirke Water, to commemorate the excursions of a seaman in the exploration of this basin. From Smyth Channel, which divides Queen Adelaide's Archipelago from the continent of South America, near 32° 10' S. lat., a long and crooked strait, which reaches down with the easterly winds, and extends between high mountains about 30 miles from the shore in a straight line, when it opens into Kirke Water, a basin about 30 miles long, and on an average eight wide. This basin extends first north-north-east, but afterwards it turns to the east. From this main body of the basin two deep inlets branch off, one towards the south and the other northward. Each of them is about 30 miles long, and they vary from one to three miles in width. The northern, called Last Hope Inlet, turns to the north-north-east, and is fat-

ates about six miles from the shores of the Pacific; the southern, called Obstruction Sound, which at its extremity bends to the south-west, is there about six miles dis-
tant from Skrying Water, but separated from it by high ranges of hills between 39° and 40° 30' S. lat., rising from the strait which unites this basin to the ocean, inter-
secting the country between the ocean and Last Hope Inlet for nearly 30 miles from the Ancon sin Salida. It is called the Canal of the Mountains.

The basin of Obway Water, Skrying Water, and Kirke Water, lies properly within the mountain-region of Patagonia, but their eastern extremities border on the eastern plains, being bounded only by ranges of flat low hills. Thus the southern portion of the mountain-region consists of the strait of Magalhaens, and on the north by Obway Water, called Brunswick Peninsula, and is connected with the main body of Patagonia only by the inlets of the Straits of Magalhaens, Skrying and Obway, and the northern extremity of the hills, by the narrow inlets, which are both narrow and deep, and are nearly 30 miles, 6000 square miles. The whole drainage therefore must run off northward to Obway Water, which is owing to the singular disposition of the highest ground of this tract.

South of the isthmus which divides Obway Water from the ocean, to the point of St. Andrews, with the exception of the hill, which rises to 1000 to 1200 feet, and is only a few miles from the strait, and parallel to it. In pro-
ceeding southward in that direction it rises into moun-
tains, covered with snow, and consequently more than 3000 feet above the sea-level. Where the mountains approach Cape Froward they sink under the line of perpetual con-
gelation, but Mount Tarn is 2600 feet high, and the moun-
tains at the back of the Cape are estimated at 2500 feet. It depresses the pressure, and precipitation, until the strait farther west-north-west to the entrance of Jerome Channel, and then north-north-west and northward along the last-mentioned channel to the place where Obway Water opens to view. This latter range seems less elevated, as the height is very variable. It is probable, they occur farther inland. The coast is hilly, but neither precipitous nor very high, and in many places there is much low and thickly wooded land. North of 47° 30' S. lat. the mountain-range seems to preserve a general width of forty miles, and the whole of this space seems to be occupied by mountains rising above the snow-line, or approaching it. They terminate on Misser Channel, which separates Wellington Island from the continent, in very high ranges, and precipice. Between 47° and 48° 30' S. lat. no snow-covered mountains are discovered near the coast, and it is not known, though the coast is hilly, but neither precipitous nor very high, and in many places there is much low and thickly wooded land. North of 47° S. lat. opposite the peninsula of Tres Montes some snow-covered mountains are discovered, but there is nothing above the snow-line. The peninsulas south of this region, which are connected by other rocks, which constitute the isthmus of Oñag, with the snow-covered mountains lying farther east. Between 47° and 48° S. lat. is the volcanic of S. Clemente, the highest summit in the mountain-range of the peninsula of Tres Montes, the highest portion of the Andes again comes close to the shores of the Pacific, and the most elevated summits are covered with perpetual snow, which in this latitude in summer seems to descend to 6000
foot above the sea-level. Mount Melli-moya, near 46° 5' about 8000 feet high. From this range are visible the Island of Chiloé, the Yntales, 6725 feet high, the Corcovado (hump-backed) 7310, and the Minchin-madiva, 7046 feet. All these high summits are situated in the range which rises close to the shores of the Gulf of Aisén. The Amagat are bounded on the west by the Andes in this part. From the Strait of Magalhaens to 41° 46' S. lat. the Andes constitute the very shores of the Pacific, and the watershed between the two oceans is so near the western coast, that the largest river which flows in the section near the origin only rises from the beach. This is the Rio S. Tadeo, the mouth of which is a little south of the peninsula of Tres Montes. The shores along this extensive coast-line are rocky and high, with the exception of a few places of very moderate extent. But there is a difference between those which are north of the peninsula of Tres Montes and those which are south of it. The former run nearly in a straight line, both the projecting rocks and the recesses between them hardly anywhere exceeding one mile in extent. But south of the peninsula the straits many miles into the mountain-masses, and thus form huge promontories. The farther we advance to the south, the more the inlets increase in depth, until we reach the Ancen sin Salida and the Jeromo Channel, which extend around the mountain-range.

But the open sea of the Pacific does not wash this rocky coast. A series of high and rocky islands lie like a barrier in front of it, so that no part of the continent, except the peninsula of Tres Montes, is exposed to the ocean's swell. Some of these islands are of great area, and are separated from one another by narrow straits, which are not visible at some distance from the open ocean, and the islands accordingly appear to be a continuous high rocky shore. The most northern is the island of Chiloé (Carlos), between which and the continent is the Gulf of Peñas, 50 miles wide; there is a much wider strait, the Chonos Archipelago, which lies farther south, by a channel nearly 20 miles wide. The Chonos Archipelago occupies the space between 44° and 46° S. lat., and consists of numerous islands near the coast, and of others which are separated from one another by narrow straits, and the sea between them and the continent is full of cliffs and rocks. Then follows the peninsula of Tres Montes, which is nearly isolated by a deep bay that enters the continent from the north, and extends about 30 miles southward. South of the peninsula is the Gulf of Peñas, which contains only scattered islands; but near 47° 30' S. lat. is the small group of the Guianaco Islands, followed by Wellington Island, which extends from 47° 50' to 50° S. lat.; its northwestern part is 50 or 60 miles wide. Many have ever conjectured that the northern and western parts of this extensive island are divided into several smaller islands by narrow channels. The long strait which separates Wellington Island from the continent, and is called Messier Channel, is 136 miles wide; the straits are at times extremely narrow; but in the middle, and for a length of about 40 miles, it is hardly a mile wide, and in three particular places not more than 400 yards wide. A broad channel, called the Gulf of Trinidad, separates Wellington Island from the Archipelago of Madre de Dios. This archipelago, which is little known, is separated from the continent and Hanover Island by Concepcion Strait. Hanover Island extends nearly a degree north and south, but it is not ascertained whether or not it consists of several islands. The strait south of this island, called Lord Nelson's Strait, separates it from the archipelago of Queen Adelaide, an assemblage of islands which run more than 80 miles north-west and south-east: only a small number of them have been surveyed; in which is contained the southernmost which separates the archipelago from the continent, and those which constitute the northern shores of the Strait of Magalhaens, which strait lies between them and South Desolation Island. [Magalhaens, Strait of.] These islands are of moderate size, and are divided into several rocky shores; but the mountains in none of them rise to the snow-line, except on South Desolation. The interior of this region is almost entirely unknown, but the information received from the climate of the coast and the islands. The difference of geographical position between the two extremes being fourteen degrees, one would expect to find a greater difference in the temperature than really exists. On the island of Chiloé the mean temperature of the winter seems to be 45°, and that of the spring 50°, or somewhat more. It is probable that the mean annual temperature is as high as that of London, for though the summer-heat is less, the cold is not so great in winter, and ice is never frozen in the low country. M. Darwin has compared the temperature of Port Famine, at the Strait of Magalhaens, at the other extremity of the mountain-region of Patagonia, with that of Dublin, as the following table shows:

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<th>Lat.</th>
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<td>53° 21' N.</td>
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<td>Port Famine</td>
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<td>60° 30'</td>
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<td>Diff.</td>
<td>0 17</td>
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It would therefore appear that the difference in the mean annual temperature between S. Carlos in Chiloé and Port Famine does not exceed ten degrees of Fahrenheit. We do not think that a country of similar extent can be pointed out on the surface of the globe where such a small difference in temperature occurs. This phenomenon is however greatly increased by the prevailing winds blow from the west, they bring to the land the moisture which they collect in passing over the wide expanse of the Pacific; and this moisture being suddenly condensed when it comes in contact with the high mountains, descends as heavy showers, descending the western slopes, never exceeding 50°, but in the seasons of their return, that is, from June to August, they are increased to 55°. The north-western gales are sometimes so furious that the houses are not secure, and the largest trees are torn up by the roots. In summer south-western winds last longer and blow more frequently than in winter. These winds prevail during the whole year.

The constant dampness of the air, though not favorable to many European plants, especially to fruit-trees, makes a vigorous vegetation. The forests, which cover the sides of the mountains for two-thirds of their height north of 45° S. lat., are less vigorous; but even at the most southern point, on the Strait of Magalhaens, the country and hills, from the height of 2000 feet above the sea to the very edge of high-water mark, are covered with trees, mostly evergreens, and some large enough to be used as timber, as the evergreen beech (Fagus betuloides), and two other species of beech. Capt. King saw large and woody-stemmed trees of Fuchsia and Veronica, in England considered as tender plants, in full flower within a very short distance of the base of a mountain, and covered with a blanket of snow when the sky was covered with snow, and this with a temperature of 36°.

Where the mountains border on the eastern plains, a kind of deer, with short straight horns, is abundant. These are also pumas as far south as 53° S. lat., and in the Andes among the high mountains. There is a very plentiful, especially several smaller kinds, which live in the subaquatic forests formed by the gigantic seaweed (Fucus giganteus of Solander), which covers all the rocks near the coast at all seasons. The land-birds are not numerous, but water-fowl abound; among which there is the black-necked swan (Anser magellanicus), and several kinds of geese and ducks. Shell-fish of several kinds occur in the recesses of the inlets, and they constitute the principal food of the inhabitants during a part of the
year. On the Guanaecao Islands and the Chocos Archipelago the potato grows wild. The largest dug up on an island of the last-mentioned archipelago measured two inches in length and an inch in thickness: they were quite tasteless.

The plains of Patagonia, which occupy the greater portion of the country, extend along the Atlantic Ocean. The line which separates them from the mountain-region is only known south of 49° S. lat.: it begins on the shores of the Strait of Magellan, which is 45° S. lat. and 74° 50' W. long., and thence runs west-north-west to the north-eastern extremity of Otway Water, follows the channels of Fitzroy Passage and the northern shores of Skyring Water to 76° W. long., and then extends along the eastern shores of the lakes which the plain is traversed by, to the Atlantic Inlet. It leaves the last-mentioned inlet near 71° W. long., and runs due northward to Mount Stockes and Lake Viedma (49° 30' S. lat.). Farther north the boundary-line is not yet known.

These plains, though similar in aspect, seem nevertheless to differ in their natural capacities. Between 47° and 48° S. lat., the coast forms a wide promontory, projecting near 100 miles from the body of the mainland. On this promontory there exist a plain 30 miles wide, called Patagonia by the Indians, and are the high lands of Espinosa, which are visible from the sea. They rise at least 4000 feet above the sea, and form a range of an irregular form with several peaked summits. It is not improbable that this range extends westward until it joins that of the Rio Negro, and is continued in the coast, as far north as 45° S. lat. and southward to 49° S. lat. The rocks are porphyritic, but they seldom rise more than 250 or 400 feet above the sea-level, when they stretch westward in an undulating plain, which is covered with a light growth of ferns and moss. This tract is dry and parched, and has no vegetation except a few tufts of grass and here and there a straggling bush of berberis or a dwarf woody shrub which supplies good firewood. There is no water. This tract is frequently traversed by the gauchos, but they never seem to stay there for any length of time.

South of 49° S. lat. to the northern shores of the Strait of Magalhaens, the coast presents an aspect similar to that of the coast of Kent in England, but it is much more shoal, the cliffs are composed of soft marly clay, without any gravel or impression of organic remains. Between the high and low tide mark, there is a smooth beach of green clay hardened by the action of the surf to the consistence of stone, which extends about a hundred miles from the coast, and is washed over by a soft green mud, over which the water gradually deepens. The outer edge of the clay forms a ledge parallel to the coast, upon the whole length of which the sea breaks with violence. The sea-beach between the high-water mark and the cliffs is composed of yellowish sand and yellowish clay, washed over by a soft green mud, which gives instance lying loose or in heaps. But the hills of the interior are flat-topped and uniform in height for many miles inland. Though the soil here also is gravelly and parched, and in most places exhibits a very scanty vegetation, the tracts are mostly covered with patches of wild grass and shrubby plants. In several places there are tracts covered with good grass and stunted trees, especially at Camarones Bay and north of it. On the banks of the Chupat river and the western shores of the lake, there are extensive tracts covered with a fine dark soil, and producing abundance of fire-wood and excellent pasturage. Wild cattle abound, and are very numerous on the natural meadows which extend far inland on both sides of the Chupat river. The river Chupat, at the distance of 20 miles from its mouth, is only 100 yards wide, and six feet deep at low-water, so that only vessels drawing 7 feet water can enter its mouth at high-water. This river runs with a winding course through a wide and fertile valley, over which the flat-topped and uniform hills extend. On both sides of the river the coniferous trees are found several hundred yards from its banks. This circumstance, and the volcanic scoria found on its banks, suggest the hypothesis that the river rises in the Andes, and inundates its valley to a great extent when the mountain snow is dissolved by the summer heat.

The climate of the plains differs greatly from that of the mountain-region. Their sterility is partly to be ascribed to the nature of the soil, and partly to the want of rain. A heavy westerly wind prevails during the winter, and though they drench the western declivity of the Andes with rain, not a drop falls on the plains while they blow. Even during the three winter months (from June to August) little rain falls except on rare occasions, when it comes down heavily for three or four days in succession. Sea-winds sometimes bring small fine rain for a few hours, all through the year, but not enough for the support of
getable productions. But it appears that rain is more abundant in the interior of the plains north of 49° S. lat. The Rio Negro covers the country from water to a great extent in autumn (May and June), when no snow on the Andes is dissolved. These inundations are produced by the heavy rains which fall in the interior of the country. Otherwise the climate is healthy and pleasant. Generally a bright sunny day is succeeded by a cloudy and extremely clear night. In summer the heat is scorching, but not sultry; and in winter, though the weather is sometimes very cold, especially during winter winds, the air is always elastic and wholesome. Changes of wind and temperature are of great rapidity, though they are not extreme. The days of temperature. Sometimes the sky is slightly or partially overcast, and occasionally clouded heavily, but on most days there is a bright sunshine and a fresh or strong wind blowing.

The plains differ from the mountain-region both in vegetation and in animals. The natives have dogs of husky build, and there are wild cattle, as already mentioned, on the banks of the river Chimput. Guanacoes are very numerous, and more so in the plains of the South than in the plains. Pumas are found everywhere, and wolves on the northern plains. There are several species of foxes, as well as cavius, armadillos, and cuscus-tucu, a little animal like a rabbit. On the coast there are common seals, fur-seals, and sea-oceans. Lizards and snakes are numerous, and spiders, centipedes, and scorpions are very abundant. Salades, partridges, doves, snipes, and rails are frequently met with, which pass southward or northward according to the season. The sea-birds consist of gulls, grebes, and penguins. There is no fish in the St. Lawrence, excepting eels, and to its greatest depth, but on the beaches they are rather plentiful, the larger species resembling cod, ling, and salmon. Insects are rare, except scorpions. Between Cape Blanco and Port Desire there are numerous salinas, or extensive hollows filled with salt, in which the salt consists of very white and good salt. Near Port S. Julian there are salt lakes, in which the salt crystallizes in great cubes.

Inhabitants.—The inhabitants of the mountain-region and plains of the plains are called Patagonians, or Horse-indians, as they wander in the interior on horseback, and do not live on the shores. The natives of the mountain-region are called Canoe-Indians, because they live only on the coast, and their canoes are short in proportion to the trunk, which gives them a clumsy appearance. Passing so much time as low huts (wigwams), or crammed in small canoes, the shape and size of their legs are injured, and they move about in a crouching posture, with the knees much bent. Their colour is that of the horse, brown, or reddish-brown. The average height of the Fuegians is four feet and some inches. The most remarkable traits in their countenance are, an extremely small low forehead, a prominent nose, narrow, oval-shaped eyes, and large, prominent ears. Their hair is black, coarse, and very dirty. Their brow is prominent, and the eyes rather small, black, and ever restless. Deficiency of eyebrow heightens the peculiar expression of the eye. Their limbs and their physiognomy a mixture of simplicity and shrewdness, their colour, brown, but very dark, in which singular wild look which is never seen in civilized men. Their faces are roundish, and the projection of the cheek bones makes them look unusually wide. The nose is a little depressed, narrow between the eyes, but broad and fleshy between the nostrils, which are rather large. The mouth is large and coarse, formed, with thick lips. Their teeth are often very good, though rather large. The chin is usually broad and prominent. All the features are large except the eyes. They have little hair either on the face or the body, and they attempt to eradicate it. Their hands and feet are comparatively small. Their limbs are not so massive as their height and apparent bulk would induce one to suppose; they are also rounder and smoother than those of white men. Their colour is a rich reddish brown, between that of rusty iron and clean copper, rather darker than the former, but lighter than the latter. They are very well made of skins sewed together, loosely gathered about their bodies and hanging from the shoulders to the ankles, adds so much to their apparent magnitude, that one would have thought from the distance above six feet, till they are actually measured. The Patagonians wander about in the extensive plains south of the Rio Negro, and traverse that immense distance (300 miles) in a comparatively short time. The same individual was seen at the Rio Negro in September, 1831; at the Rio Negro, in September, 1832; and again at Gregory Bay, in March, 1833. Their principal subsistence is the flesh of mares, emus, camels, and guanas. They broil their meat and eat it with a lump of salt and not cooked. They have a name called tus, and the other chulah. The tus is a bulbous root, which, when cleaned and baked, becomes nearly like a yam. The chulah is a long white root about the same of a goose-quill, and is eaten roasted or put in broth which contains some of the tus. Some of the men, and not the nor are horses, unless disabled by accident. Their hats are in shape not unlike gipsy-tents. They consist of poles stuck in the ground, to which others are fastened; the whole is covered with skins sewn together, except towards the east.

That tribe of Patagonians which principally visit the southern plains is called Te-huelche, or Southern People. In the stony district between 43° and 45° of the tribe of Patagonians to make a long stay. There should be three other tribes; one, the Pe-huelche, or Eastern People, who move about in the country along the coast; the Chilian Indians, who ramble over the districts adjacent to the Andes south of 42°; and the Molucho, or Warrior Indians, who occupy the interior of the country south of the Rio Negro to about 45° S. lat.

The mountain-region is inhabited by two tribes of the Fuegians. Near Otway and Skyring Waters is a tribe which Captain Fitzroy calls Huemul, because they have very few of the kind of ra-pages, viz., the Huemul, in his 'History of Chili,' huemul. Another tribe, which inhabits the western coast of Patagonia, between the Strait of Magalhães and the promontory of True Muson, he calls Chonos, founding the name on the supposition that they are the natives of the Chonos Archipelago, over the Chonos Archipelago, which at present is quite uninhabited. The Fuegians are rather short, varying in height from 4 feet 10 inches to 5 feet 6 inches, yet their bodies are as bulky as those of a man of six feet. Their limbs and joints are short in proportion to the trunk, which gives them a clumsy appearance. Passing so much time as low huts (wigawams), or crammed in small canoes, the shape and size of their legs are injured, and they move about in a crouching posture, with the knees much bent. Their colour is that of the horse, brown, or reddish-brown. The average height of the women is four feet and some inches. The most remarkable traits in their countenance are, an extremely small low forehead, a prominent nose, narrow, oval-shaped eyes, and large, prominent ears. Their hair is black, coarse, and very dirty. Their brow is prominent, and the eyes rather small, black, and ever restless. Deficiency of eyebrow heightens the peculiar expression of the eye. Their limbs and their physiognomy a mixture of simplicity and shrewdness, their colour, brown, but very dark, in which singular wild look which is never seen in civilized men. Their faces are roundish, and the projection of the cheek bones makes them look unusually wide. The nose is a little
pieces of bark sewed together, from 18 to 20 feet long, and from 1 to 2 feet wide in the middle, the extremities being broader. Their upper surfaces are adorned with small holes, about 1 inch deep, into which the bees put their waxen honeycomb. Their lower surfaces are shaped like regular hexagons, about 5 feet high and from 4 to 8 yards in diameter. They are made of branches of trees, stuck into the ground and bent towards the top, on the outside of which skins, pieces of bark, and bunches of coarse grass are roughly fastened. The bees Indians have canoes, or other boats, made of planks sewn together with strips of twisted bark and rushes. These boats are nearly 30 feet long and 7 feet broad, and are pulled with oars. The tribes are poor to counterbalance the smallness of the islands in small families, on account of the scarcity of food. They live on only on seeds, birds, fish, and particularly shell-fish, and they are consequently always moving from one place to another. During the summer they prefer the coast, where they obtain a great quantity of eggs and young birds, besides seals, which come in shoals to breed at that season. In winter they retire more to the interior and waters in search of shell-fish, and the small and numerous and excellent fish which they catch among the sea-weed (Psa tea gigantea). The Fugians, like all savages living on the produce of fishing, have as much more inclined to improve their condition by adopting the habits of foreigners than the Patagonians or other American tribes who subsist by the chase.

(Surveysing Voyages of the Adventure and Beagle; Part 2: Buenos Ayres and the Province of La Plata)

Patan, [Hindustan, vol. xii, p. 215], 1820

Patanisco. [Maryland.]

Patran. [Sulu Archipelago.]

Patran. [Sulu Archipelago.]

Pate. [Another might be the case of France, but neither his age nor the roister under whom he studied is known, which is not a little surprising, considering the high and deserved admiration in which his works are held. He appears to have taken Claude Lorraine for his model, and in his later works he is called the French Claude. It cannot indeed be said that he equalled that great artist, yet it is no mean honour to have inspired him successfully. He shows that he diligently studied nature. His subjects were always well chosen; his foregrounds are judiciously broken, his trees are unparallelled, and of his trees remarkably elegant and airy: The antique buildings, ruins of aqueducts, vases, and other ornaments give great variety and richness to his pictures. His touch is light and firm, and his colouring clear and natural. His figures are superior to those of Claude, being generally elegant and correctly drawn.

Patella. [Skeleton.]

Patella. [Chirobranchiata.]

Patent. [Before applying for a patent for an invention, two conditions are necessary: first, what is entitled to a patent; and next, whether the invention has the requisite conditions.

In the first place, the machine, operation, or substance produced thereby, which patent is said to be, must be new to the public use, either the original invention of the patentee, or imported by him and first made public here. A patent may be obtained for England, Ireland, or Scotland, although the subject of it may have been publically known and in use in either or both of the other two countries.

In the second place, the subject of the invention must be useful to the public, something applicable to the production of a vendible article, this being the construction put upon the words 'new manufacture' in the statute of James I. The different parts of a patent are: the subject of the patent is entitled to that protection: such principle must be applied, and the manner of such application is a fit subject for a patent.

Inventions entitled to a patent may be briefly enumerated as follows:

1. A new combination of mechanical parts, whereby a new machine is produced, although each of the parts separately be old and well known.

2. An improvement on any machine whereby such machine or apparatus can be of performing better or more beneficially.

3. When the vendible substance is the thing produced either by chemical or other processes, such as medicines or saltpetre.

4. Where an old substance is improved by some new working, the means of producing the improvement is in most cases patentable.

If the inventor think that the machine, operation, or substance produced comes under any of these enumerations, and that it is new, and likely to be useful to the public, he may enter a caveat at the Patent-Office, and at the offices of the attorney-general and the solicitor-general, in the following form:

'Caveat against granting letters-patent to any person or persons for (here describe the invention in the most general terms), without giving notice to A.B., of , in the county of .’

(Date)

These caveats stand good for twelve months, and may be renewed from year to year: the fee for entering such caveat is £1.

As soon as the caveat is entered, the inventor may find it necessary to obtain the assistance of workmen or others, in order to carry his invention into effect; and if in doing this he should make known to the patentee, he will not thereby lose his right to a patent. Any communication which is necessary for carrying his ideas into effect is not considered as a legal publication, which would of course vitiate his right, as the invention could no longer be called new. But though the inventor is thus protected in his experiments, and is safe while dealing with honest people, he is not protected against fraud. If a person in the secret should make such invention public, or cause it to be used by several persons between the time of entering the caveat and the next stage of proceeding, that of sending in the petition, no patent could be granted to the person who first declared that the petition could not be made, or, if made, would be untrue. Again, if such workman, instead of making it public, were to give to some other person the necessary information, in order to make the invention public, he must, if the invention be his own; and if he could succeed in concealing the source of his information by a false declaration, he might force the real inventor to allow him to participate in such patent, or to forego it altogether. The caveat can do no more than prevent persons from profiting by the invention, without appropriating them to his own use, to the exclusion of the inventor; and it will also ensure notice of any application for a patent for a similar invention, and, in some cases, prevent the expenditure of time and money upon a subject for which someone else has obtained a patent. Any one who makes a caveat can do: its effect is frequently much over-rated. If any one apply for a patent, a party of which is similar to that contained in the caveat, the attorney or solicitor general will send a notice of such application to the enterer of the caveat, and, who, if he is desirous of interfering with his invention, must, within seven days from the receipt of the notice, state in answer his intention of opposing such patent.

The attorney or solicitor general then summons the applicants to appear separately before him; and if he should be of opinion that the two patents will interfere with each other, or are virtually the same, the usual course is not to grant any patent except to the two claimants conjointly, because the other one can be prevented by either, he has undoubtedly the right to the protection of the statute.

If the invention is of such a nature that it can at once be produced or put into operation, no caveat is needed; and indeed a caveat may be the means of exciting the very attention and opposition which it is intended to prevent. Where some experiments or operations which require assistance must be performed before a definite title can be given to the invention, as must be done in the declaration and petition, it is much better to avoid the caveat; and by getting the patentee of the earlier invention to agree to divide the profits of different persons, if possible, keep the invention secret until the patent right be secured.

The next step is, to draw up a petition to the crown, before doing which however the papers are to be examined by the court. To those who have not considered the subject, this may not seem a very difficult matter, but in fact it requires the greatest care; for the least discrepancy between the title and the description contained in the specification will endanger the patent. (See Patents to Inventions, 2nd ed., 1836, a Committee of the House of Commons upon this subject, 1829.)

The title should set forth the subject of the patent in such terms that any one may see if a patent has been taken out or applied for in the case of any similar invention. The titles of patents collectively should form an index of the inventions thus protected. It is a common practice however to make the title as obscure as it can be made without endangering the patent, in order that the real object of it may be kept secret. But this is a matter of
great difficulty, and has often justly vitiated a patent. The law requires all patented inventions to be open to public inspection, and the enterer of a caveat may be cheated by a title, for although the subjects may be the same, a title may express the invention so faintly, or indeed so falsely, that the very way of describing the invention may escape the notice of the attorney-general, and injustice may be done by granting a patent to one party while priority of invention belongs to another. By the 5 & 6 Will. IV. c. 83, a patentee is as much entitled to a disclaimer of any part of the specification with the consent of the attorney-general or solicitor-general, who may order such disclaimer to publish his disclaimer. This act supplies a remedy for unintentional errors, but is ineffectual where the title is purposefully false and the disclaimer done in an operatively retroactive, so that if an action be commenced before the entry of the disclaimer, the title and specification must be adduced on the trial as they originally stood. A caveat may be entered against the granting of such disclaimer.

The following are a few instances of patents being lost through defective titles:

In the case of King v. Metcalfe (2 Starkie, N. P. C., 249), the subject of the patent, which ran up to 12 feet in height, was the "Improvement Mode of Burning Cities, Towns, and Villages." The patent was declared void, as the specification only described a new lamp, and not an improved mode of lighting. The patent was held to be void, as the specification only described a new lamp, and the only improvement was in the manner of burning.

In the case of Bloom v. Elisee (6 Barn. and Cres., 169 & 178), the title of the patent was the "Improvement for Making Paper in Single Sheets, without Seam or Joining, from 1 to 12 feet and upwards in width, and from 1 to 45 feet and upwards in length." The specification described a machine capable of making paper of a width greater than 12 feet, but the patent was declared invalid as the specification did not describe a machine for making paper of a width greater than 12 feet.

In the case of Boulton and Watt v. Jessor (1755), a patent was declared invalid as the specification did not describe a machine for making paper of a width greater than 12 feet.

An honest and valid title may be stated, in a few words, to be a description of the precise object of the invention in the most simple language.

The title being stated, the petition must be drawn in the following form:

"The humble petition of A. B., of the county of
in the name of your petitioner hath invented (here insert the title which you intend the patent to bear), that he is the first and true inventor thereof, and that it has not been practised by any other person or persons whatsoever, to his knowledge and belief.

Your petitioners therefore most humbly pray that your Majesty will be graciously pleased to grant unto him, his executors, administrators, and assigns, your royal letters-patent under the great seal of Great Britain for the sole use, benefit, and advantage of his said invention within England and Wales and the town of Berwick-upon-Tweed, and also in all your Majesty's colonies and plantations abroad, for the term of the invention, pursuant to the statute in that case made and provided."

The passage in Italsia must be omitted if the inventor does not intend to obtain patent for the colonies. This petition, with a declaration annexed, must be left at the office of the attorney-general or solicitor-general, or at the office of letters-patent. If such report be favourable, it must be taken and left at the Home-office for the queen's warrant, which is addressed to the attorney or solicitor-general, and the warrant will be prepared. The bill is in effect the draft of the patent and contains the grant with an allowance of the clauses and provisions in the letters-patent. It is signed by the secretary of state for the home department, and by the attorney or solicitor-general. If at this stage of the proceeding the patent is not sealed, it may be entered in the manner already described, but the enterer is required to deposit 30l. at the office of the attorney or solicitor-general to cover the patentee's expenses if he should succeed in establishing his right to patent. The bill, when prepared, is sent to the privy-seal department for the queen's sign manual. It must then be passed at the signet-office, where letters of warrant to the lord-keeper of the privy seal will be made out by one of the clerks of the signet; and lastly, the clerk of the privy seal will make out a patent, which is placed in an envelope in which the office of the patent will be prepared, sealed with the great seal, and delivered to the patentee. Considering the number of offices through which a patent passes, it might be supposed that the inquiry into the validity of the claim is very rigid, and that if the patent is sealed, it is safe from opposition. But in reality the law officer through whose office it is carried exercise no opinion upon the validity of the patentee's claim; the whole responsibility of the matter rests upon the patentee, by pursuing the following form of letters-patent.

The first part of the patent recites the petition and declaration, and sets forth the title which has been given to the invention by the inventor.

The 2nd relates to the grant of the exclusive use of the invention to the inventor for the space of fourteen years, whereby all other persons are restrained from using the invention without a licence in writing first had and obtained from the patentee, and persons are restrained from counterfeiting or passing the patentee's invention, or any addition thereto or subtraction therefrom, with intent to make themselves appear the inventors thereof. This clause also directs all justices of the peace and other officers not to interfere with the inventor in the performance of his invention.

The 3rd is a recital of the time mentioned in the petition, where it is to be read, if contrary to law or prejudicial and inconvenient to the public in general, or not the invention of the patentee, or not first introduced by him into this country.

The 4th declares that letters-patent shall not give privilege to the patentee to use an invention, for which patent has been obtained by another.

The 5th relates to the manner in which letters-patent become void, if divided into more than a certain number of parts, or if a number of such shall be used for five, but all patents sealed since May, 1782, allow invention to be divided between twelve persons or their representatives. This part also relates to the granting of licences.

The 6th contains a proviso that a full and accurate specification shall be enrolled by the patentee in a specified time.

The 7th directs the patent to be construed in the most favourable manner for the inventor, and provides against inadvertency on the part of the clerk of the crown in declaring the letters-patent.

Letters-patent then only grant the sole use of an invention for a certain time, provided that the statement in the declaration be true, that the title give a distinct idea of the invention, and that the specification be enrolled within a specified time.
the attorney or solicitor general, a longer or shorter period being granted according to the extent or difficulty of the invention; in some instances two years have been allowed for specifying.

The object of the specification is twofold: —

First, it must show exactly in what the invention consists for which a patent has been granted, and it must give a detailed account of the manner of effecting the object set forth in the title. It must describe exactly what is new and what is what is advantageous or necessary to effect the object of the invention. The introduction of any part that is old, or the omission of any part that is new, equally vitiates the patent.

In the second place, a patent is granted for a certain number of years on the condition that such full and accurate information in the specification and the drawings as will enable any workman or other qualified person to make or produce the object of the patent at the expiration of that term without any further instructions. A specification is bad, if it does not describe the means of doing all that the title sets forth. It is equally bad if it describes the means of effecting some object not stated in the title: it is incomplete if it mentions the use of one substance or process only, and it can be proved that the inventor made use of another or that another substance or process was actually employed in the application of the invention. The use of a patentee is invalid by claiming too much; thus, after describing one substance or process, he must not say that the same invention can be carried out by another process or substance. A specification is defective if it does not describe one or more substances or processes produced or described. The following is an instance in which a patent was set aside by such an expression. In specifying a machine for drying paper by passing it against heated rollers by means of an endless fabric, the inventor, after describing one sort of fabric, the only one in which he used, went on to say that any other sort and proper material might be used. Now if he used any other means of effecting his object, such means should be described, and if he did not use it, he should so state.

This alone rendered his specification incomplete; but, besides this, it was proved that no other fabric would answer the purpose, or rather that no other was known, and the patent was annulled accordingly. The cases which have been already mentioned of the invention of the gas light, by supposing the title to be good, be converted into instances of bad specifications, as the invalidity arises from the title and specification not agreeing with each other. It is not necessary to say anything further on the necessity of the greatest care being taken in the drafting of patents.

The patentee may describe his invention just as he pleases, and he may illustrate such description by drawings or not; but he should be careful to use words in their most common acceptation, or if some technical use should have prevailed in the art, the inventor to employ such words, and otherwise to explain them so that he intends them to be taken in such perverted sense. Subjoined is the form of the other part of the specification.

To all to whom these presents shall come greeting, I the said [patentee's name and residence] send greeting. Whereas Majesty in his letter patent under the great seal of Great Britain, bearing date at Westminster, the day of [name of month], in the [year of reign], did give and grant unto me the said [name of inventor], my executors, administrators, and assigns, for and in consideration of the sum of [sum], the sum of one pound sterling, and also for and in consideration of the sum of [sum], to be paid in the said Majesty's High Court of Chancery within calendar months next, immediately after the date of the said in part recited letters patent, reference being thereunto had more fully and at large appear. Now know ye, that in compliance with the same, I the said A. have hereunto set my hand and seal this day of [name of month], 1840. (Name and seal.)

'Taken and acknowledged by A. B., party hereto, the day of [name of month], 1840, at

'Before me,

'B—— C——'

'A master (or master extraordinary) in Chancery.'

The specification being completed, it only remains to enrol it before 12 o'clock on the day of the expiration of the time allowed in the letters patent. All specifications are open to public inspection upon payment of a small fee, and books are kept at the Patent-office, Lincoln's Inn, which contain a list of all patents in force. These books may be inspected, by permission of the clerk, without any charge whatever.

Extension of Term of Letters Patent.—If a patentee finds that the time allowed him by the patent is not sufficient to remunerate him for the trouble and expense of his invention and patent, he may apply for an extension of the term of the patent. This was done by the Act of Parliament 3 Will. IV. c. 83; but this condition is somewhat modified by 2 & 3 Vic., c. 67.

Scotch and Irish patents are obtained by process similar to that described for England; the applications however are made to the registrar of patents respectively.

The complicated nature of the proceedings in obtaining a patent has led to the establishment of a class of persons who make it their business to obtain patents for inventors; and in case of an intricate invention, it is far better for an inventor to employ such agents, and to be wary of the risk of the errors and loss of time which may be occasioned by his inexperience. The fee charged by the clerks of the Patent-office, who act also as agents, is ten guineas, exclusive of the cost of the fees and expenses of the solicitors. The patent office has been established by the Act of 12 Geo. III. c. 27, and the expenses are by the Act fixed at £120l. 5s. 6d. for England, with sl. additional for the colonies, 100l. for Scotland, and 125l. for Ireland.

It is evident that there are many inventions which will not bear this outlay of capital, and the consequence is that some of them are not much developed. This is well exemplified in the case of canals, which are now under a more moderate arrangement. This may seem at first sight to be beneficial to the public, but such is not the case. The inventor, if he procure a patent, will take care that although he may be the party incomenenced at first by the outlay on hand, he shall pay for it eventually; and, if he does not take out a patent, he will do all in his power to keep his invention secret for a longer time than the patent would have allowed. This circumstance has given rise to much of that jealousy which is so apparent amongst manufacturers; it has materially hindered the study of the arts, which are now
fenced round with secrets and difficulties, and has been mainly instrumental in causing the great want which confessedly exists, of men conversant at once with the theory and the practice of mechanical operations.

The true nature of these inventions will be admitted by all who have been in any way connected with manufactures; but if any evidence be wanting to convince those who are not, the small number of patents taken out in England is quite conclusive. In 1637 the number of English patents was six; in 1645, sixteen; in 1700, sixty-three; in 1820, sixty-three; and Prussia were much larger. Much has been said against the present law of patent, which in our opinion is unfounded in truth. There are difficulties connected with the title and specification which cannot perhaps be smoothed by any amendments; but the law has placed in the hands of inventors can easily be removed. There is nothing to prevent patents being granted in a quarter of the present time, and at a tenth part of the present expense. When the truth of the inventions will rapidly increase; talent, which is inert for want of motive, will be called into action, and the workshop will no longer be closed against the philosophic inquirer.

PATENT. [Patterns]

The truth of the inventions is founded on the 21 James I., c. 3, to which reference is made in the article MONOPOLIES, and on the cases decided under that statute. It is also somewhat modified by the 5 & 6 Wm. IV., c. 83, and 2 & 3 Vic. c. 67. The patent is not a grant, but is a certificate that the subject can claim as a matter of right; it is the free gift of the crown. The form of the grant is by letters-patent, which, being the deed of the crown, are considered as of public record. The property acquired by the grant of a patent consists of the right of making certain things or of putting together material things in certain specified proportions or forms, in order to produce some definite result; and it also consists in the sole right of selling or allowing to others the use of such material thing or the means of making the same, by such definite method as is defined in the patent. The grant of a patent may extend for forty years from the date of the first letters patent, or for such other time under fourteen years as the grant may contain. A patent cannot be held in any way by any person, unless twelve persons shall be interested in it. With the exceptions above mentioned, a patent is in all other respects personal property, and of course may be sold or disposed of by will. The patentee may also grant licences to other persons to use his patent. If the patent is infringed, the patentee or his assignee may bring his action for damages against the offender. The patentee or his assignee may also file a bill in equity against the infringers of the patent, and this is generally the best method of proceeding. On a bill being filed, immediately on the application of the plaintiff a temporary injunction is granted, which is supported by an affidavit, an injunction may also be obtained restraining the defendant from violating the patent until he puts in his answer or until further order of the court. The defendant may move to discharge such injunction upon filing a written affidavit stating that he may make a full and complete motion on putting his answer. When an injunction cannot be obtained either before the answer or upon the answer, and there is a doubt about the validity of the patent right or the infringement of it, the court will generally direct the defendant to keep an account of the proceeds of his manufacture, and will also either direct an issue to try the facts of validity or infringement, or leave the patentee to bring his action. If the patentee can establish the validity of the patent, the patent right will then grant an injunction against its infringement.

There is a further advantage in applying to a court of equity in the case of an infringement of a patent; the court can direct the trial at law in such manner as it thinks just and necessary to be examined, and the trial who was false, and which would be otherwise cannot be competent witnesses; and who will be of certain fact of infringement is done secretly, it can order the manufacture or workshop to be inspected.

Letters-patent may be invalid on various grounds, although the invention is actually a new one. These grounds, as appears from the statute of James (s. 6), may be, that they are 'contrary to the law,' or 'mischievous to the state by raising the prices of commodities at home, or 'hurt of trade or generally inconvenient.' The proceeding by which a patent can be filed is a very short form, and the nature of the former of these two objections is shown in the article MONOPOLIES, but it is a ground for cancelling a patent which can now hardly occur. The other ground, that of a patent being mischievous to the state, is also not likely to be of common occurrence; but if an issue were joined on facts which showed that a patent was mischievous to the state, such issue might be tried, and the patent might be declared void. The patent is of course also void, and may be cancelled if it is proved that the patentee is not the true and first inventor, that the object is not in his possession, or that any other ground for his disqualification have given to those words in the statute of James, or that the specification is not correct enough, or that the patent has not been properly obtained.

PATENT TETERS. [Letters Patent]

PATENT YELLOW, a compound of oxalate of chloride of lead, or oxichloride of lead, for the preparation of which several processes have been proposed, as by decomposing common salt with litchir or oxide of lead, and with the result of the several experiments which are subjoined. It is sometimes formed by heating together chloride of lead with 4 or 5 parts of oxide of lead, or by heating 10 parts of oxide of lead with one part of hydrochlorate of ammonia (sal ammoniac). It is of course constituted of different proportions of the compounds which form it, according to the method in which it is prepared. Since the introduction of chromate of lead, it is much less used than it was formerly.

PATERA, an open vessel approaching to the form of a cup, used by the Romans in the ancient times when they received the blood of the victims, and with which they made libations. The word contains the same root as patera: 'patera ut et ipsum nominem indicio est, possibilium planum et patens est ' (Macrobius, Saturn, v. 21). Virgil, in several passages of the 'Aeneid,' alludes to the uses of the paten as Lib. vi. c. 268. Suntque omnibus tepidissimae crassum Sucupratum patera.

Lib. iv. 60. Terea patera dextarum polihcrum frusta, Posseque horum placuit eatenus fons.

Lib. vii. c. 133. Mone paterna libate Jovi.

On medals the patera is represented in the hands of several of the deities (Rasche, Lexicon Universum Re Nummata tom. iii. part ii., pp. 925, 927), and frequently in the hands of persons, to mark the sacred spiritual authority as joined with regal power. The patera was of gold, silver, bronze, marble, glass, or earthen. Such as had served for libations and wine or any other liquor at a funeral were usually deposited with the ashes of the deceased. Patella (that is, patera) also meant the classic bowl of Patera.

PATER'ECULUS, VELLE'US, was born about 15 b.c.

He served in the army under Augustus, was made military tribune, and accompanied Tiberius in his German and Italian campaigns. On his return to Rome he was appointed procurator of a praetor, tribune, procurator, which office he filled in the year of the death of Augustus. He wrote his abridgment of Roman history, which he addresses to the consul Vicius or Vincentius, A.D. 24, after the proscription of Sejanus. Paterculus is supposed to have lost his life at the time when Sejanus suffered, as he was a friend of that favourite, whom he praises in a rather fulsome strain near the end of his work. The 'Historiae Romanae' of Paterculus consist of two books. The first book begins with a brief notice of the early history of Greece after the Trojan war and the fall of the Greek colonies in Italy; it then mentions the foundation of Rome and the establishment of a senate by Romulus, after which there is a hiatus of 600 years, occupied by the history of the MS. of the history of Rome, which resumed at the time of the war against Perseus, and briefly relates its result, as well as the destruction of both Carthage and Carthage. The second book is complete, and written at length. It treats of the disturbances of the times of Augustus from the death of Tiberius to the death of Sejanus, and of the war between Caesar and Pompey, of the second triumvirate, of the resignation of the principate of the empire, and of the death of Agrippa. The work of Paterculus has been printed: 'The Bipont edition, 1790, with Dodwell's 'Annales Velleianus,' is a useful edition.'
PATERNOSTER. [CASTANIA]

PATHOLOGY (from θέρας, 'disease,' and λέγον, 'a disease') is the science of diseases, and especially of those which affect men and animals which are the subjects of medical treatment.

For the perfect knowledge of the nature of a disease, the first thing to be determined is its cause; and this is commonly regarded as twofold. The predisposing cause or condition (for the term cause cannot fairly be used in this sense) is that state of any individual which renders him peculiarly liable to the attack of any or some particular disease, of which another person, or he himself at another time might be in little danger. Of these predisposing conditions the most important is hereditary disposition, by which an individual being constituted with the same peculiarities of internal and of external form and composition, whilst a greater number of them may affect the same diseases as they were. Such are the peculiarities of temperament or constitution with which each individual is born, and by which they live through disposed to peculiar character of disease; and such also are the special hereditary peculiarities, such as asthma, and probably many more diseases. Other predisposing conditions are the peculiarities of constitution which are acquired in the course of life by particular modes of living. Each individual is subject to the circumstances to the conditions of climate, &c. in which he is placed, and is peculiarly liable to be affected by changes of these external conditions. A person of effeminate habits living carefully secluded from all excitements of disease, and many of them are the result of any of them than one whose frame by a hardy course of life is rendered comparatively invulnerable to all. Any means by which the strength of the body is reduced renders it more liable to diseases of all kinds, and hence our idea of bodily strength is drawn not more from the muscular power of the individual than from his immunity from the effects of those circumstances which in others excite disease. There are also local peculiarities of individuals of the body which render them especially liable to disease; such as the state of the skin, the nature of the hair, the polycliths, the skin, the frequent appearance of a particular symptom of disease, &c., which is brought about by the action of any one of these. Each one of these affects the individual, and is the peculiar object of the disease. That the same excitant will be most likely to produce in the child an affection of the head, in the youth a disease of the chest, and in the adult or old person some order of the abdominal organs. An event may occur, however, may exist throughout life without the occurrence of actual disease; in order to produce disease, some more immediate or exciting cause is necessary. This excitant must be the more powerful the less the predisposition: but under whatever circumstances disease is produced in one particular disease, the immediate cause is in the individual, and in part by the peculiar mode of action of the excitant. Thus, after the same exciting cause (for example, exposure to cold and damp), one person may have rheumatism, another pleurisy, a third a fever, and another may escape altogether unharmed. But there are other excitants of disease which prevail over all predisposition, and produce a certain character of disease, which constitute the constitution of the patient can only slightly modify: such are the materials of the disease, &c., the temperature, the existence of other diseases, &c., which produce in all which they attack a similar affection. Many persons however escape from the effects of these excitants, and by long exposure become insensible to them; hence the diseases of peculiar climates (endemic) affect the foreigners much more than natives; but even in those persons in whom they do not produce disease, those conditions, which are excitants of disease in others, modify the characters of diseases that occur from any other source; and hence in the course of an epidemic all diseases have a tendency to assume the characters of that which is prevalent. Other excitants of disease, still more universal in their influence and more constant in their consequences, are all things which act immediately on the composition or construction of the body or of the blood, such as mechanical and chemical influences on all kinds.

The nature of a disease being determined by the condition of the individual and the exciting cause to which he is exposed, the next division of pathology is the study of the symptoms or signs by which the progress of a disease is marked, and by which it expresses its nature and is determined. Of these signs of disease, many are express of the altered condition of the part chiefly affected, as pain in a wound, or a local inflammation, coughing in a disease of the lungs, sickness in a disorder of the stomach: but a few are signs which are not limited to each particular organ, which suffer in association with those primarily affected; such are pain in the head when the digestion is disorder, coughing in diseases of the liver, sickness after violent blows on the head. Sometimes these secondary symptoms are so striking that they can be mistaken for the primary disease; as when in a disease of the hip the chief pain is felt in the knee, or in hysteria any organ may appear disordered except that which actually is. These secondary symptoms are ascribed to what is called sympathetic, unsatisfactory, and not always indicative and probable connection of symptoms of two organs, of which one only is supposed to be materially affected. Entire ignorance must be confessed of the nature and origin of these secondary symptoms; but it is not improbable that different symptoms of disease than acute or chronic affections, and of the hectic fever of many chronic affections; but it is probable that all sympathies will be found to be due either on some communication of excitation from one nerve to another through the medium of the spinal chord or brain, as in the reflex actions [NERVE], or on some change in the blood which affects both organs at once, or which, originating in the disease of one disturbs the functions of the other or of the whole body.

Whether directly or indirectly produced, all the symptoms of disease are only the perversions of the natural functions of the part affected, or appreciable changes in its structure, value and meaning therefore can only be determined by a comparison with the same functions and structure in health; in other words, this, like all other parts of pathology, cannot be rightly studied without a constant reference to physiology. It is believed that an organ may be only functionally deranged; that is, that its several functions, or the very unison of the organ, is altered without the existence of any material change in its structure and composition. These are called functional symptoms, but their number is probably much less than they are generally believed, and it is most likely that they are limited to the functions of the body, and the disorder of each is modified in the mode and measure of the influence of the nerves upon them. For all other symptoms we must assume the existence of a substantial change in the part affected, or in the materials on which it has to act, although in many cases these changes are fugacious or inappreciable by our senses.

For a due performance of all the functions of organic life [LIFE], a healthy structure of each organ, and a healthy composition of the blood, on which the health of the whole is alike necessary; a deviation from health in either will therefore produce the symptoms of disease; a conclusion in which the long continued disputes of the moral pathologists, who ascribe all the evils of society to the moral corruption of the individual, have at length merged. To these two kinds of alterations, and to perturbations in the distribution of the nervus influence, it is probable that the signs of all diseases may be referred; but from the peculiar nature of the nervous system, the nervous communication between all its organs, no one of these changes can long continue without producing the others; and hence in diseases of any degree of severity the symptoms are commonly a mixture of the disorders of all the functions of the body, and the disorder of each is modified by the changes in all those circumstances on which its healthy state depended, as the condition of the blood, of the nervous influence, &c. Neither are the symptoms in any
case constant phenomena; for the influences of all external circumstances upon a diseased body are very different from those which they exert upon the healthy body, and many things which were necessary to health are supporters of disease, as the usual amount of food, of bodily and mental exertion, &c.; so that exclusion from them becomes necessary, and this again further modifies the performance of the disordered functions.

The history of a disease is completed by the process of natural recovery or by the observation of the changes in the state of the subject by which it is cured. The influence of remedies cannot justly be considered as a branch of pathology; though most important for their utility, still, in their relations to the natural history of a disease, medicines do not possess so many interfering circumstances, or so many means of experiments for the determination of the relation of the diseased body to particular agents, by which the nature of the disorder affecting it may be sometimes ascertained.

The recovery from disease is an example of the exercise of that power by which the body can make unusual efforts to prevent its own destruction: this has been called the vis medicatrix nature, or curative force of nature. It is exerted in many cases in which disease cannot be said to exist, but where rather there is an exaggeration of health; as, when a muscle suffers from overuse and an unusually great amount of waste not only repairs its loss, but actually becomes larger and stronger, so that it can bear the same amount of constant waste better than it could when it was in healthy condition. When a person is exposed for a time to cold in bathing, the speedy consequent flushing of the skin is an increase of the warmth of the surface. The term reaction is applied to phenomena of this kind, and it may be said that reaction takes place whenever any injurious influence is applied to the system; in those cases the reaction effects a once and for all restoration to health, as in the instances above mentioned; in others the reaction is itself the most prominent feature of the disease, as in fever and inflammation.

The recovery from disease is rarely perfect. Although nature may be left behind with the patient, the part diseased is commonly for ever after weak, that is, more than usually liable to the same or to some other disease. It is probable this liability is owing to some morbid change in the structure of the part insensible to our present means of examination, and though even in severely diseased, we never see a perfect restoration of its healthy structure and form. Even in those tissues that are most easily repaired, there is not an actual reproduction of their original structure.

The period occupied in the progress of a disease to recovery or death is the basis of the chief division of acute and chronic diseases. The severity of the symptoms may in both cases be the same; but in general those of chronic cases are worse than those of acute cases.

When the disease terminates fatally, or when death takes place from any other cause at a distant period from its occurrence, we obtain perhaps the most valuable because the most certain part of pathological knowledge, that of the material and complex which the morbid state has produced. This, the study of morbid anatomy, is often specially called pathology. By the examination of the altered parts and a comparison of the changes of structure which they present with those which are known by observation of external diseases or by experiment to result from certain leading morbid processes, as inflammation, &c., we are enabled to determine the nature of that which had existed beyond the limit of our senses, and thus to appreciate correctly the meaning of the phenomena which had marked its progress during life, and the powers and impotencies which it had in the course of its existence to which it owes its origin. The practical value of such knowledge is the power which it affords of determining during life the nature of each disease, and the appropriate remedy for each.

PATINA, a name given to the rust or errone of coins and medals. Pinkerton (Essay on Medals, ed. 1789, vol. i., p. 164) says, 'nothing contributes so much to the conscription of brass or copper coins as that fine rust, appearing like varnish, which, when lying in a particular posture, impregnated with iron. Silver takes many kinds, but chiefly green and red, which yield to vinegar. For in gold and silver the rust is prejudicial, and to be removed; whereas in brass and copper it is present and ornamental; a circumstance remarked by the ancients, as in the pools of randa rubiginis of Juvenal may prove, and that essece Greek phrase which terms patina yelh. oikov to dower of brass.' This fine rust, which is indeed a natural varnish, not imitable by any power of human art, is sometimes a delicate blue, like that of a turquoise, sometimes of a bronze color, equal to the observable in ancient statues of bronze, and so highly prized; and sometimes an exquisite green, a little on the azure hue, which last is the most beautiful of all. It is also found of a fine purple, of olive, and of a cream colour, or pale yellow; which last, as it is an imported commodity, much avarice of it, as paper of cream colour, is used in all great foreign pressrs, does copper-plates and printing. The Neapolitan patina is of a light green; and, when free from excrescence or blenheim, is very beautiful, or like a piece of fine bronze. Sometimes it gives a tinge of another colour, with as fine effect as a variegated silk or gem. In a few instances a rust of deeper green is found; and it is sometimes spotted with the red or bronze shade, which gives it quite the appearance of the East Indian stone blood stone. These are also much prized. The production of time, as hard as the metal itself, and preserves so much better than any artificial varnish could have done, concealing at the same time not the most minute part of the impression of the coin.

PATMOS, a small island, one of the Sporades, near the south-western coast of Asia Minor, and about 30 miles south of Samos. It is now called Patmos. Patmos is chiefly remarkable for having been, according to the early traditions of the Church, the residence of the apostle St. John, who is said to have written his Revelations there. The island is a continuous rock about 5 miles in circumference, rugged and barren, except a few fertile spots which abound with olive and other trees. There are several good harbours, of which the most frequented is that on the north-east side. The only town is situated on a high rocky eminence rising abruptly from the sea; it consists of about 400 houses, which, with about 50 more at La Scala, form the republic of Patmos. The island is a bishopric, with the name of St. John, bishop of Patmos, and is one of the three bishoprics which the natives say that St. John wrote his Revelations from, and they have built a small church over it. (Tournefort, Histoire, Voyage dans la Grèce.)

PATINA, the modern capital of Bahr, is situated on the south-west side of the Ganges, in the 27th degree N. lat. and 83° E. long. The city, within the walls, is about a mile and a half long, from east to west, and about three-quarters of a mile broad from north to south. This part of the city is very closely built, but the suburbs are of far greater extent, and are built on the opposite side of the Ganges, with a breadth of about two miles; but the build- ings outside the walls are irregularly placed, and with considerable spaces between them. The greater part of the houses are of mud, the rest are built with brick, and here and there the whole is tiled. The number of houses, according to Dr. Buchanan Hamil- ton, was 52,000, in 1811, and the total population 312,000, about two-thirds of whom were Hindus, and the remainder Mahomedans; the number of Europeans is very small.

The city is the seat of a college, founded in 1811. There were 24 bankers established, several of whom had agents at the principal commercial cities of Hindostan. A considerable trade is also carried on in opium, rice, ass, and sugar, and in the exportation of silk goods.

Patras is distant 155 miles from Beneventum, from Lokara 316 miles, from Agris 544, and from Delhi 661 miles by travelling distances.

PATRAS, the ancient Patrae, a town on the north-east

of the Peloponnesus, and about six miles distant from the Gulf of Lefanto. It stands on a ridge about six miles long, of which the acropolis, or citadel, crowns the summit, and commands the view of a fine and fertile plain: it stretches along the sea-coast. Mount Yodha, one of the summits or points of the Moron, rises above the town. It is built. The plain of Patras produces a great quantity of currants, which form an article of export. The hills are planted with vines, from which a good red wine is made. Many of the houses are surrounded by gardens, with orange, fig, pomegranate, and other fruit trees; but
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the houses themselves are ill built and mast of wood. (Leake's Morea.) Previous to the Greek revolution, Patra was the most thriving town of the Morea, being the em- porium of the trade of that peninsula as well as of western Greece; it contained about 10,000 inhabitants, mostly Greeks, and had consuls of some European nations at present about 8000 inhabitants. The eparchy or district of Patra contains 112 villages besides the town.

Patra was one of the twelve cities of Argolidian Ionia, or Arcadia, and was a colony of the ancient town of [Ach. E.] After the battle of Actium, Augustus sent a colony to Patra. The present town occupies the same site as the old one, but few remains of antiquity are visible, except some statues in the acropolis, which are noticed by Leake.

PATRIARCH (πατριάρχης, the head of a family), a title given to the heads of families in the early history of the human race, and more particularly to the ancestors of the people of Israel down to the time of Moses, and especially applied to the descendants of Jacob, as the ancestors of the twelve tribes of Israel.

There is a book in existence entitled 'The Testaments of the Twelve Patriarchs, the Sons of Jacob,' containing what profess to be the dying admonitions of the patriarchs to their descendants. This book has been published in Greek by Grabe, from MSS. in the universities of Oxford and Cambridge (Spenig. Patr., tom. i., p. 129), and again by Fabricius (Cod. Pseudoepigr. Pat. Text. 1712, p. 456); it was translated into English, in order to regulate the affairs of the church, and into English by Whiston, in 'A Collection of Records belonging to the Old and New Testament, London, 1727-8. Whiston had a dissertation to prove the authenticity of the work, but his arguments are very slender, and the book is undoubtedly spurious. There is no evidence to prove that it ever existed in Hebrew, and the earliest reference to it by any antient writer is one by Orion, who expressly asserts that it formed no part of the canon. It contains allusions to and quotations from passages both in the Old and New Testament, and the writer evinces an amount of knowledge of Christianity which was not possessed even by Christians till some time after the ascension of Christ, much less before the time of the apostles. A good notice of the work (Credibility, pt. ii., ch. xxix., s. 3), gives the following summary of the allusions to Christianity contained in this work:—Thus this author, in an indirect manner and in a pretended prophetic style, bears a large testimony both to three hundred years after the ascension of the Lord, and to the books of the New Testament. He speaks of the nativity of Christ, the meekness and unblamableness of his life, his crucifixion at the instigation of the Jewish priests, the wonderful concomitants of his death, his resurrection, and ascension. He represents the character of the Messiah as God and man, the Most High God with men, eating and drinking with them, the Son of God, the Saviour of the world, of the Gentiles, and Israel, as eternal high priest and king. He likewise speaks of the effusion of the Holy Ghost upon them among his apostles, and the descent of the Holy Ghost at the pentecost; his unrighteous treatment by the Jews, and their desolutions and the destruction of the Temple upon that occasion; the call of the Gentiles; the illuminating them generally with new light; the effusion of the Spirit upon believers, especially the promises of the future fortunes of the church, and its dominion upon the Gentiles. Here is little notice taken of our Lord's miracles: however, he speaks of the Messiah as a man who renews the law in the power of the Most High, in which expressions the working of miracles seems to be implied. There are some allusions to the gospels of Matthew, Luke, and St. John, the Acts of the Apostles, the Epistle to the Ephesians; first to the Thessalonians, first to Timothy, the Epistle to the Hebrews, the first Epistle of St. John, and the Apocalypse. It is difficult to determine, with his assumed character, the author declares the canonical authority of the Acts of the Apostles and the Epistles of St. Paul. Lastly, he recommends the reading of the Holy Scriptures.' (Lardner's Works, vol. ii., p. 363, ed. of 1831.) In a passage in the Testament of Benjamin (sec. 2), the prediction in Gen. xlix. 27, seems to be applied to the apostle Paul. Others of the early Christian writers also apply that text to Paul. In these Testaments the canonical scriptures are never quoted by name, but are designated by titles which are so quoted are the 'Scripture of Esnoch, the Tables of Heaven' (Esnoch), and the 'Scripture of our Fathers.'

The author of this book was probably a converted Jew, though not, as Cave supposed, a Judaizing Christian. It seems to have been written about the end of the second century.

PATRIARCH, in Church History, was the ecclesiastical chief of a diocese, which included several provinces. It is not known at what time this title was introduced into the church; but before the fourth century the bishops of Rome, Antioch, and Alexandria, had obtained a degree of pre-eminence over the other bishops. In the time of Constantine the Great the bishop of Constantinople was made to rank with the three just mentioned; and either then or not long after, the title of patriarch was given to these four prelates.

The number of these dignitaries was increased in the fifth century. The patriarch of Constantinople reduced under his jurisdiction, Antioch and Alexandria, and obtained the title of 'Universal Patriarch.' The bishop of Rome was called 'Prince of the Patriarchs.' The struggles of the patriarchs of Rome and Constantinople for supremacy was the chief cause of the separation between the Eastern and Western churches.

The powers of the patriarchs are thus described by Mosheim:—They alone consecrated the bishops who lived in the provinces that belonged to their jurisdiction. They assembled yearly in council the clergy of their respective districts, and directed the affairs of their dioceses. The cognizance of all important causes, and the determination of the more weighty controversies, were referred to the patriarch of the province where they arose. They also pronounced a decisive judgment in those cases where accusations were brought against bishops, and pointed vicars, or deputies, clothed with their authority, for the preservation of order and tranquillity in the remoter provinces. (Mosheim, Ecc. Hist., Cent. v., pt. ii., chap. 2.) There were however provinces of the empire which were exempt from their jurisdiction.

The Greek church is at present governed by four patriarchs, namely, those of Constantinople, Jerusalem, Antioch, and Alexandria.

Twelve Patriarchs (Patres, Patrieci, in Latin) was the appellation of the members of the original houses or gentry, of which the Roman populace, the ruling power in the community, was at first composed, and of their descendants, either by blood or adoption. The houses are said to have been seven in number in the time of Charlemagne, fifteen in the time of the papalSEE. The families composing a gentry were not necessarily related by consanguinity, for individuals might be adopted into a gentry. The definition of a gentry by Seevola (Cic., Top., c. 6) is, that the members bore a common name, were descended from freemen, without any stain of slavery or servitude, and had never held public offices; they had common sacred rites, or sacrifices appointed for stated days and places. When a family became extinct by default of heirs in the male line, its property reverted to the gentry of which it formed a part. Gentile and Jewish patriarchs were therefore distinguished from their descendants belonged to the gentry of which they bore the name, but they had not the rights of the gentry, that is to say, the gentile rights. Natives of the confederate towns of Latium coming to seek a home at Rome attached themselves to the gentry family, the head of whom was styled their patron, and they were styled his clients. (Clients)

The members of the senate, the consuls, and the ponti- fices were, in the first ages of the republic, chosen exclusively from among the patriarchs, until the year 363 n. c., when Linus and Cletus were elected, with dedicatory functions, by which the plebeians were admitted to the consulsiply, as well as to the custody of the Sibylline or sacred books. (Linarius Stolo.)
When the plebeians became eligible to all the offices of the state, a new nobility was formed, consisting of those who had filled the offices of consul, praetor, or curule aedile, and this nobility was transmitted to their posterity with the property of their ancestors. The right of putting up in these houses the images of their ancestors. Still a distinction in opinion continued to prevail in favour of the patricians, or older nobility, as distinguished the plebeian from families.

When Constantine transferred the seat of the empire to his new city, he established there a new senate and a new patrician order, the members of which were appointed by the emperor. After the fall of the Western Empire, the officers sent by the Byzantine emperors to administer the provinces of Italy subject to them were chosen from among the patricians of Constantinople. Thus we read in the history of the dark ages, of the 'patrician of Rome,' meaning the governor or representative of the Eastern emperor in that city, and the title was afterwards assumed by Charlemagne and his successors.

At Venice the name of patrician was given to the members of the great council, or supreme legislature, and their descendants, and their names were registered in the golden book. After the decree of February, 1297, called 'La serrata de' patrizi, there was no new member introduced into the council, but all descendents of those who had once sat in the great council, on arriving at twenty-five years of age, were by right members of the sovereign assembly, and patricians of Venice. 'Patrizio Veneto' was a title of nobility, considerably equal to that of any feudal noble not of a sovereign house.

In other parts of Italy, such as Genoa and Rome, the word patrician was and is still used in common language to denote a member of the hereditary nobility, independently of feudal titles.

PATRICI, SIMON, born 1625, died 1707, a prelate of the English church, distinguished as the author of many excellent works in practical divinity and expository theology. He was a native of the town of Gainsborough, educated in Queen's College, Oxford, and in 1649 and 1650, engaged in public labours as a clergyman was the parish of Saint Paul's, Covent Garden, of which he was rector, till higher preferment was bestowed upon him; he became dean of Peterborough in 1679, bishop of Chichester in 1689, and bishop of Ely in 1691.

The titles of his writings will show at once their nature and tendency to have been to promote Christian piety and to foster the spirit of devotion. In their day they were much esteemed, and they are still valued as among the best helps for the support of good and useful learning. 'Parable of the Pilgrim,' 'Exposition of the Ten Commandments,' 'The Friendly Debate,' 'The Christian Sacrifice,' 'The Devout Christian,' 'Advice to a Friend,' 'Exposition of the Glorious Epiphany.' Beside these, there are his Paraphrase and Commentaries on the books of the Old Testament, which have been several times reprinted.

These writings are the foundation of Bishop Patrick's reputation. He also compiled and published Gunton's 'History of the Church of Peterborough.'

PATRICK, ST., the apostle of Ireland, was born, according to Usher and Tillemont, in the year 372. The former places his death in 493, but Tillemont about the year 455. Nisbit, at the mouth of the Clyde in Scotland, in the year of the birth of St. Columba, consequently in 464.

The two principal ancient Lives of St. Patrick are, that compiled by Jocelin, a Cistercian monk, in the twelfth century, who quotes four lives written by disciples of the saint; and that of Rubricus, who, according to the Ballindrist, lived in the seventh century. In both, legendary tales are intermixed. The chief authentic information we possess concerning this saint is obtained from his own writings, his 'Confession,' and a letter which he addressed to Corotic, a prince of the Welsh, after the Christians had been abandoned by the Romans, who made a descent upon Ireland during St. Patrick's mission to that country. From the 'Confession' we learn that he was born in a village called Bonan venian, supposed to be the town of Kilravock in the north of the Clyde in Scotland between Dumbarton and Glasgow. He calls himself both a Briton and a Roman, meaning of mixed extraction; and says his father was of a good family, named Calphurnius. His mother was Conchella, or Conchessa, who, according to some writers, was niece to St. Martin of Tours. According to Nennius (abbot of Bangor, A.D. 620), St. Patrick's original name was Mair; that of Patrick was given to him by Pope Gregory the Great, and he was consecrated bishop, and went as a missionary into Ireland, A.D. 433.

Jones, in his 'Historical Account of the Welsh Barths,' Lond., 1794, p. 13, says St. Patrick was born at the Vale of Rhos in Pembrokehire.

His festival is marked on the 17th of March in the Martyrology of Bodleian.

(See the Acta Sanctorum of the Bollandists, 'Month of March,' vol. ii., p. 517-592; Butler's 'Lives of the Saints,' vol. iv. Dublin, 1759, vol. iii., p. 176-186.)

PATRIMONY OF NEW-WESTER. [VITREHO]

PATRINIA, a genus of plants of the natural family of Valerianaceae, consisting of a few species found in S. China, and Japan, and to which the long-felt yielde of the East was referred by Mr. Dorn, but which has been introduced into a new genus, Nardostachys. (Sternard, Sweet Carnelian.] PATRISTIC THEOLOGY. [Theology.]

PATRON. [Benefice; Patrim.] PATRONUS; derived from pater, father, as master is from father. The relation of Patron and Client (clientis) in ancient Rome is discussed in the article CLIENTE: but the relation between a freedman (libertas) and his patronus requires a few words of exlication.

In the Roman polity persons were divided, with respect to status or condition, into freemen (liberi) and slaves (servi). Freemen were again divided into persons who were born in a state of freedom (ingeniius), and those who had been manumitted (libertini). A manumitted slave was called libertus. His master had the right to 'free' and 'manumit' him, which he became his patronus. The slave who was manumitted received the genitive name of his patronus (Lactant., iii. 3; and accordingly we read of a freedman of Plopes and Pompeus Lencus (Plin., Hist. Nat., xxx. 3), and of his freedman Julius (ibid., xxxi. 3), and of another called Callius Tiber, who is frequently mentioned in Cicero's letters. The relation between patronus and libertinus resembled in many respects that between patronus and cliens; but it appears that the mutual rights and obligations were better defined by public opinion than fixed by any positive enactment. The patronus, on the one hand, was bound to take the libertus under his protection; and the libertus on his part was bound to assist his patronus by every means in his power, but the less the latter was in circumstances, the greater was the obligation. It was when the patronus or his children had become too poor to support themselves. In such a case, if the patronus or his children proved to the satisfaction of the governor in whatever the necessities of their condition, he or she received from their libertus a certain sum (seditivum) for his or her support. (Diz. xxv., tit. 3. s. 9.)

The most important part however of the connection between the patronus and the libertus was the right which the former had in certain cases to the property or possession of the property of the latter upon his death. This right was founded upon the fact, that the law required patrocinium, the adnati of their liberti, and consequently they succeeded to the property like any other adnatii. Thus, a patronus, a manumitted slave, intestate and left no heir (suus heres), the patronus succeeded to his property. (Gaius, iii. 40; Justinian, Inst., iii., tit. 7, s. 1.) If the heir was born of his own body (naturalis), no one had a right to complain; but if he was the result of an adoption, a son (filius), should deprive the patronus of the right to the property. This injustice was remedied by a later edict, by which it was regulated that natural heir, whether by the power of their father at the time of his death, or by a person who had been adopted, or by another person, provided they had not been declared, should alone be a bar to the patronus's right to the property; and if a libertus who had had no natural son made a will, he was obliged to leave half of his property to his patronus; and if he left none of his property, or less than half, his patronus possessed of half was given to the patronus, even against the words of the will: if the libertus died intestate leaving an adopted son, a wife (in marito), or a daughter—
law (in matu illi eius), half of the property was also given to the patrones. (Gaius, iii. 40; 41; Institut., iii., tit. 7, s. 3.)

By the Lex Papia the rights of patres to the property of their rich freedmen were still further increased. By this law it was enacted, that if a libertus died leaving property to the value of 100,000 sestertii, a portion of his property was to have no claim to a will or died intestate, provided he had fewer than three children. If he left only one son or one daughter, half of his property went to his patres, as if he had died leaving no son or daughter; if he left two children, a third went to the patres, and if three, the patres had no claim to any portion. (Gaius, iii. 42; Institut., iii., tit. 7, s. 2.)

With regard however to the property of a liberta, the ancient law sufficiently protected the rights of the patres, and therefore the law of the Twelve Tables could not, like the patres, obtain by the praeator's edict the half of the property of a liberta who had left only an adopted son or a wife or daughter-in-law. By the Lex Papia however, an ingenua patrona, who had brought forth a son of the age of ten years, was entitled to one third of the property, and if she had brought forth four children, she obtained the same right as the patres. (Gaius, iii. 44; Ulp., Fr. xxix. 3.)

The patres, previous to the passing of the Lex Papia, only had the same right to the property of the liberta as was granted to the Twelve Tables, and it could not, like the patres, obtain by the praeator's edict the half of the property of a liberta who. had left only an adopted son or a wife or daughter-in-law. By the Lex Papia however, an ingenua patrona, who had brought forth a son of the age of ten years, was entitled to one third of the property, and if she had brought forth four children, she obtained the same right as the patres. (Gaius, iii. 44; Ulp., Fr. xxix. 3.)

The rights of a patron to the property of a liberta only related to his direct heredes, sons, grandsons, great-grandsons, &c., and never belonged to his collateral heirs (extra heredes). (Gaius, iii. 58.) A patron was able to assign a liberta (adsignare libertum) to one of his sons to the exclusion of his other children, so that on the death of a liberta, the son to whom the liberta had been assigned was alone entitled to the property, which was due to the property by the jus patronatus. (Instit., iii., tit. 8; Dig., 50, tit. 16, s. 107.)

All the preceding remarks respecting the succession of the patres to the property of the liberta, only apply to those liberti who were Latini (Latinum Jus). Those liberti who were Latini (Latinum Jus), or Dedici, had in fact no power over the disposal of their property. The Latini libertae had the privileges of freemen while alive, but lost the life of a slave liberta on the death of their property, and their property, like the peculia of slaves, came by the Lex Junia to the persons who had manumitted them (Gaius, iii. 56; Institut., iii., tit. 7, s. 4.) The succession to the property of the liberta Latinus differed also in many other important particulars, which Gaius has pointed out (iii. 57-62), from the succession to the property of those liberti who were Roman citizens. By a decree of the senate passed in the reign of Claudius during the consularship of Lupus and Largus, it was enacted that the property of the Latini should be transferred to the third returned to the party registering, with a certificate, which certificate is by the Act held to be evidence of registration.

Every article manufactured according to such design must have thereto the name of the first registered proprietor, the number of the design in the register, and the date of the registration.

Any person printing a design thus protected is liable to a penalty of from 5L to 30L. for each offence, which may be recovered by an action at law, or by summary proceeding before a magistrate.

Registered designs may be transferred from one person to another, in which case the latter is entitled to be registered as the proprietor. Printed forms of such transfers are supplied at the office.

The following are the fees ordered to be paid by the trea-
Pau has several local government offices, a Cour Royale, or court of justice, having jurisdiction over the three departments of Basses Pyrénées, Hautes Pyrénées, and Landes; an Académie Universitaire, whose circuit is coextensive with the jurisdiction of the Cour Royale; a royal college, with a museum and a collection of philosophical instruments; also a library, containing 10,000 volumes, a collection of pictures, a drawing-school, an agricultural society, a theatre, and public baths.

Pau was the birthplace of the Jesuit Pardies, a good geometer and astronomer; and of Bernadotte, the present king of Sweden.

The arrondissement of Pau comprehends an area of 641 square miles: it is divided into eleven cantons or districts, each under a justice of the peace; and comprehends 204 communes, with a population, in 1831, of 117,685; in 1846, 147,000.

Pau, ST., the great Apostle of the Gentiles, originally called Saul, was born at Tarasus in Cilicia. Though a Jew of the tribe of Benjamin, and a Pharisee of the most rigid sect, he was by birth a Roman citizen. He was framed by Tarsus, upon some of whom it had been condescended to give services rendered to the state. (Lardner.) The year of his nativity is not known. He was present at the martyrdom of Stephen, A.D. 34, on which occasion he is first introduced to our notice, as he called a young man to assist him in his sufferings, not with the intention of making it the occupation of his life, but because it was a custom among the Jews to instruct their youth, even of the highest respectability, in some mechanical art. Having been educated in the learning of the law, for which Tarasus was famous (Acts xiii. 673, Cassian), and in which he undoubtedly made great proficiency, he went to Jerusalem to study the men and traditions of his people under Gamaliel, a distinguished rabbi. Being a man of great talent, ardent mind, and flexible resolution, and being despised and hated by the institutions of his country, whose origin and antiquity he impressed and fascinated his imagination, he contemplated with alarm and anxiety the progress of the new religion. Accordingly he took an active and prominent part against it. In fact, he was a most implacable enemy of the Jerusalem church. He pursued the disciples of Jesus with a burning fury, that his conduct towards them is described as 'breathing out threatenings and slaughter.' He obtained letters from the Sanhedrim to the synagogues of the Jews at Damascus, and also to the governor, authorising him to come to Jerusalem, where he would pursue the disciples of the saviour with as much severity as in his native city, and was employed for years in propagating the faith through the neighboring regions of Syria and Cilicia. Up to this time the preaching of St. Paul and of the other apostles had been confined to the Jews. The conversion of St. Paul proved of the very greatest and most momentous consequence in the progress of Christianity. It occurred A.D. 35, two years after the crucifixion of our Lord.

After his baptism at Damascus he went into Arabia. In A.D. 36 we find him again at Jerusalem, and in A.D. 37, shortly after, he was compelled to escape secretly and by night, in consequence of the persevverance with which the Jews sought his life; for preaching with so much boldness and success the religion which he once laboured to destroy, from Jerusalem, his native city, and was employed for many years in propagating the faith through the neighboring regions of Syria and Cilicia. Up to this time the preaching of St. Paul and of the other apostles had been confined to the Jews. The conversion of St. Paul proved of the very greatest and most momentous consequence in the progress of Christianity. It occurred A.D. 35, two years after the crucifixion of our Lord.

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pointed Acts, xiii.); and he commenced his first apostolic journey a.D. 45, ten years after his conversion. In company with Barnabas and Mark the evangelist, he sailed from Seleucia, and successively visited Salamis and Paphos in the Isle of Cyprus; Perga in Pamphylia, and Antioch in Pisidia; Iconium, Lystra, Derbe, Lystra, and Iconium; and made converts and founded churches in these places. At the end of two years he returned to Antioch in Syria. While at Antioch he was engaged in a most important controversy with some Jewish Christians, who asserted that circumcision was necessary to be performed on the old and new converts. St. Paul, on the other hand, contended that Christianity entirely superseded the Mosaic Law, and required conformity to none of its rites. The question was referred to a council of apostles and elders at Jerusalem, who, after much deliberation, decided in favour of the new faith. St. Paul, on the other hand, contended that Christianity entirely superseded the Mosaic Law, and required conformity to none of its rites. The decision was declared to have received the sanction of the Holy Ghost, and it was communicated to the gentile converts at Antioch and other places.

In the year 56, St. Paul commenced his second apostolic journey. Leaving Antioch, and passing through Syria and Cilicia, he traversed the whole extent of Asia Minor, and came to Troas. From Troas, in obedience to the direction of a vision, he sailed over into Europe; and after preaching the gospel at Philippi, Thessalonica, Berea, and Athens, arrived at Corinth, to which city he was eminently successful in establishing an important Christian community in that learned, wealthy, and voluptuous city. From Corinth he sailed to Ephesus, and thence to Macedonia, thence to Jerusalem, and taking Jerusalem in his way, returned to Antioch, a.D. 58.

The apostles, to the Theissalians, and his Epistle to the Galatians; the two former, and probably the latter, from Corinth. Having remained a short time at Antioch, he set out upon his second journey, and, after passing through Syria and Cilicia, he traversed the whole extent of Asia Minor, and came to Troas. From Troas, in obedience to the direction of a vision, he sailed over into Europe; and after preaching the gospel at Philippi, Thessalonica, Berea, and Athens, arrived at Corinth, to which city he was eminently successful in establishing an important Christian community in that learned, wealthy, and voluptuous city. From Corinth he sailed to Ephesus, and thence to Macedonia, thence to Jerusalem, and taking Jerusalem in his way, returned to Antioch, a.D. 58.

On this journey he wrote his first Epistle to the Corinthians, from Ephesus, his first Epistle to the Thessalonians, from Macedonia; his second Epistle to the Corinthians, from Macedonia; and his Epistle to the Romans, from Corinth. These journeys occupied him about thirteen years.

While St. Paul was at Jerusalem, some Asiatic Jews, seeing the success of the Temple, endeavoured to excite the populace against him by denouncing him as a dangerous and destructive agitator, who was aiming to abolish all distinction between Jew and gentile, teaching things contrary to the laws of Moses, and that the Temple was unnecessary. On the contrary, he insisted that the uncircumcision was healthful within its proper limits. The mob roused by this appeal to their passions and their prejudices, would undoubtedly have murdered the Apostle, had he not been rescued by the officer of the Temple guard. The subsequent events, instead of confirming the Jews in their animosities, increased the Jewish fear of the new religion, and led to the second and the third opinions of the Jews, which were those of the Jews when St. Paul was at Rome, a.D. 65, where he was imprisoned a second time. 'Knowing his departure to be at hand,' he wrote his second Epistle to Timothy; and it is supposed he suffered martyrdom, a.D. 66.
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his reader; sometimes disclosing in a few words the profoundest views of Christian truth. His appeals to the passions sometimes alarmed his disciples. His history then become the spring of human action; to these he addressed himself, as well as to the reason; not by cold speculation on abstract fitnesses, but by the solemn infallibilities of a resurrection from the dead to an eternity of happiness or misery. With a like solemnity he instructed them in the higher moral faculties. Though disclaiming the 'enticing words of man's wisdom,' he could, when the occasion required it, use the arts and display the accomplishments of the rhetorician. His speeches in the Acts of the Apostles are worthy of the Roman senate; and his answers, when he was at the bar, to the questions proposed to him by the court, are distinguished for their address and their dignity. At the same time, wherever he happened to be, whether among the Jews in Pædia, or the Gentiles at Lystra, or the polished Greeks at Athens, or pleading before Felix and Agrippa, his discourses are adapted with admirable judgment and ability to the character and capacities of his several audiences. On the subject of St. Paul's writings, see Dr. Harwood, Michaelis, and Bishop Newton.

There is a tradition in the church that Paul was beheaded near Rome, and buried about two miles from the city, in the Via Ostiensis. A magnificent cathedral dedicated to his memory was built over his grave by Constantine. *But his noblest monument,* observes Dr. Hales, *consists in his inspired writings, which, the more they are studied, the better they are understood, the more they will be admired to the latest posterity for the sublime and beautiful, the most pathetic and impressive, the most learned and profound specimens of Christian piety, oratory, and philosophy.*

PAUL, ST., CATHEDRAL OF. [LONDON.] 

PAUL OF SAMO'S istA was chosen bishop of Antioch in A.D. 260. In consequence of being supposed to hold heterodox opinions concerning the person of Christ, a synod at Antioch absented him from his sentiments. After holding several meetings, this synod was unable to extract from Paul an avowal of his suspected heresies. In the year 263 another synod was convened on this business, consisting of a large number of bishops, presbyters, and deacons. A resolution was formed by the church at Antioch, succeeded in convicting Paul of the erroneous opinions imputed to him. He was excommunicated by this synod, which wrote an epistle to Doyunus, bishop of Rome, and to the churches of the empire, giving the decision of this resolution, which is now preserved by Eusebius. Though deprived of his bishopric, Paul refused (probably under the protection of Zenobia, who is known to have favoured him) to give up the churches of the city till the year 272 or 273, when the bishops who had excommunicated him applied to the emperor Aurelian, who compelled Paul to yield. It is probable that he continued after this to propagate his doctrines. His followers formed a sect under the name of Paulians or Paulineans, which seems to have lasted to the 5th century. They were condemned by the Council of Nice, who ordered those baptised among them to be re-baptised.

The accounts we have of his doctrines are not very clear. The synodal epistle of the council which deposed him speaks less of them than of his personal character, which is represented as marked by meekness, humility, and sufferings in the exercise of his authority, and great love of pomp and display. He held some secular office together with his bishopric. The following statement of his opinions by Mosheim appears, as far as we have the means of judging, to be tolerably correct — That the Son and the Holy Ghost exist in God, in the same manner as the faculties of reason and activity do in man; that Christ was born a mere man; but that he descended into the flesh and human nature from the throne of glory, and that the greatness of the majesty and power of God have been revealed to men by him. The councils, churches, and sects of the world, and the multitude of the Gentiles, are, according to the divine Word, with the man Jesus, Christ might, though improperly, be called God."

(Lardner's Conduct, pt. ii., chap. xiii., sect. 8; Mosheim's Ecclesiastical History, Cent. iii., pt. ii., chap. v., sect. 15.)

PAUL THE DEACON, or PAULUS DIA'CONUS, called also Warnafrodis from his father's name, was born about the year 740, at the town of Fruli (Forum Juli). He became attached to the court of Ricasia, king of the Lombards, and afterwards (about 763) he left the court and was ordained deacon of the church at Aquilea. He returned to the court of Ricasia, by whom he was made chancellor. About the part of his life which followed the overthrow of the kingdom of Dauidarius by Charlemagne in 774, we know nothing for certain, but the most probable account is, that he retired to his native Fruli, where he interested himself in the monastery and in the church of Monte Casino, whence he addressed to Charlemagne in the year 781, an elegy, in which he implores the release of a brother who had been taken prisoner in the Lombard war. About this time Charlemagne appears to have attached him to his court. He did not visit Italy, until he was about 80 years of age, when he went to Rome. The clergy of the place who were to accompany the emperor's daughter Rotrude in her journey to Constantinople to be married to the son of the empress Irene. Paul visited France, and stayed some time at Mias, the seat of the bishops of which he wrote a history. He afterwards returned to Monte Casino, where he died about the year 799.

As a poet Paul is spoken of in the most extravagant terms of praise by his contemporary Peter of Pisa. His poems, which are really good, consist chiefly of hymns and other short pieces in Latin. His fame rests however chiefly on his merits as an historian. His works were,—1. *Histoia Miscellae,* a Roman history consisting of twenty four books, of which the first eleven contain the history of Etruria; the next five, by Paul himself, contain the period of the history from Etruria to Gaul; the remaining books are attributed to Landolphus Sigal. The best edition of this work is in Muratori's *Rerum Italicas Scriptores.* 2. *De Gestia Longobardorum Libri Sex,* a history of the Lombards; his most valuable work. The text is in MS. in the library of Muratori in the coporum Metamai. 3. *Life of St. Gregory the Great: 6. Excerpta* from Festus De Verborum Signification. [Ferrara.] There are also extant a collection of Homilies and two sermons which are attributed to him.

PAUL THE SILIENTIARY, the son of Cyrus and grandson of Fousas, was of a noble family and possessed of great wealth. He held in the palace of Justianus the office of chief of the Silentiarii, a class of persons who had the care of the public affairs of the state. St. Ambrose, the bishop of Milan, wrote a letter to Paul the Silentiary, urging him to be the protector of St. Sophias at Constantinople was rebuilt by Justinian in (542). Paul wrote a description (or lessirio) of the edifice, in 1628 Greek hexameters, with a proemium consisting of 154 stanzas verses. It is evident from this poem that Paul the Silentiary was a Latin translation, by Du Cange, Paris, 1670. Paul was also the author of a poem entitled sigic ad by Biscop SiRed, and several Epigrams, which are included in the Greek Anthologia (Fabricii Bibliotheca Graeca, ed. Harles, vol. iv., p. 457; and vii., p. 581.)

PAUL I. succeeded Stephen III. in the see of Rome A.D. 757. He was involved in disputes with the Longobard king Desiderius, and sought the protection of Pepin, king of the Franks. He died in the year 766.

PAUL II., a Venetian by birth, succeeded Pius II.: 1464. He began by correcting abuses, and checking the exactions of the officers and secretaries of the Papal court, who levied contributions at pleasure from those who had done nothing to deserve them. He forbade the use of the old decrees and other official papers. He endeavoured also to form a league of the Christian princes against the Turks, who threatened Italy; and for this purpose he proclaimed, in 1468, a general peace among the Italian governments, threatening to burn those who disregarded it. Paul made himself at Boso of Este the investiture of Ferrara with the title of duke as a feudatory of the see of Rome. [Err. House or.] An academy had been formed at Rome for the cultivation of Greek and Roman antiquities and philsophy, of which he was president; and a number of learned men were members. Paul, who, unlike his predecessor Pius II., had no taste for profane learning, became suspicious of the academicians and their meetings. Some one probably excited his suspicions, by accusing them of infidelity; and the design of some of his papers was to make the_New Testament_ more tyrannical, and some of its men ran away, others were seized and tortured, and among them Platina, who after a year's imprisonment was released through the intervention of several cardinals. It may easily be supposed that Platina, in his "Lives of the Popes," which he wrote after his return under the authority of Paul II., would represent Paul in a beneficent and exemplary light, in order to show his zeal for the repudiation of Gargnano, and the return of the College of Cardinals to the papal court. The information which is collected in this essay is taken from the most recent and authentic sources, and is given in such a manner as to enable the reader to form a correct judgment of the subject."

(Poggio to the New Testament, pt. ii., chap. viii.)
Sixtus IV, did not spare the memory of Paul II. But besides Platina, other contemporary writers, such as Corio Ammirato, an anonymous chronicler of Bologna, and the monk Jacopo Filippo of Bergamo, all speak unavourably of the pontificate. Paul II's state maintained itself, however, until July 1471, when he was succeeded by Sixtus IV. Cardinal Querini had undertaken the defence of Paul II., in his 'Vindicium adversus Platinam aliquoque Obrectatores.'

PAUL III., Cardinal Alessandro Farnese, succeeded Clement VII., in October, 1534. At that time the most urgent applications were made by the various states of Europe to Rome for the assembling of a general council, which was required by the state of the Western church, distracted by the schism of Luther and Zwingli, as well as by that of Henry VIII. of England. The manner of that union to be considered before he finally acceded to the request, and it was only in 1542 that he issued the bull of convocation. In the mean time he excommunicated Henry VIII., and released his subjects from their oath of allegiance, by which measure he caused a new quarrel with the emperor. In 1540 he sanctioned the new ordination of the Jesuits. The war between Francis I. and Charles V. occasioned a further delay in the assembling of the council, which was finally opened at Trent in 1545. That assembly, which was preoccupied with religious controversies, was hindered by the removal of Trent, did not terminate its sittings till 1563, long after Paul's death.

Paul was very anxious to aggravate his own family. He had a natural son, Pier Luigi Farnese, whom he first made duke of Parma, and afterwards of Piacenza. For his grandson Ottavio Farnese he obtained the hand of Margaret, a natural daughter of Charles V., and made him duke of Camerino. The pope subdued the people of Perugia, who had revolted against him, put to death seven nobles, and the civil peace was restored by the conciliation of Cesare, in which he consented to yield to Cesare the 'Interim.' In the same year Paul received the news of the tragic death of his son Pier Luigi, who was murdered at Piacenza, where he had made himself odious by his tyranny and his lust. Overcome by grief at the news, he held the Masses in his chapel, and that night went to bed with him at the time, to take warning from their father's death, and to live in the fear of God. Having secured the succession of Parma and Piacenza to Pier Luigi's son, Paul died, in November, 1559, at a very advanced age, and was buried with much ceremony in the cathedral of Parma, where his body now lies, inviolate in the papal territory. The duke advanced to the gates of Rome, but after some demonstrations a peace was concluded in 1557. Having learned that his nephews, one of whom he had made a cardinal, were leading a most dissolute life, Paul, instead of conferring them with the dignity of cardinals, and the abbey of Fontevraud, he banished them from Rome in 1559. Paul IV. died shortly after, eighty-four years of age. He had been a zealous advocate of the tribunal of the Inquisition. As soon as the news of his death became known, the people of Rome, on his inscription, ran to the prison of the Inquisition, wounded a Dominican monk who acted as commissary, delivered all the prisoners, and burnt the papers. They then threw down the statue of the pope, crying out *Death to the Caraffas.* The tumult lasted several days, and concluded with the execution by the name of Pius IV., who instituted a process against the nephews of the late pope, two of whom, Cardinal Caraffa and the duke of Palermo, were found guilty of several crimes, and put to death in 1568. (Storia d'Italia, ii. 16; Caraccioli, Collectanea Historica de Vita Pauli IV.)

PAUL V., Cardinal Camillo Borghese of Siena, succeeded Leo XI. in 1605, when he was fifty-three years of age. His first act was a dispute with the senate of Venice concerning two ecclesiastics, subjects of that state, who, being accused of heinous crimes, were on their trial before the civil magistrate. The pope asserted that clerical men could only be tried by their bishops, and as the Venetian senate maintained the latter rights, Paul laid Venice under interdict. The senate forbade the publication of the bull, and as the members of several monastic orders professed that they could not continue to perform religious worship in a country placed under interdict, they were allowed to quit Venice, and the pope ordered secular priests to perform service in their stead. The people remained perfectly quiet, and the bishops and vicars continued their functions as usual. It is reported that the grand-vicear of the bishop of Padua having said to the podestà, or civil governor, that the ought to the city, with the view of the inspiration of the Holy Ghost, the podestà replied to him that he understood that the Holy Ghost had already inspired the Council of Ten with the resolution of hanging all those who would not obey the orders of the senate, and others, wrote in defence of the senate, and Cardinal Baronius and Bellarmino wrote in defence of Rome. There were those points at issue between the pope and the senate: 1, the senate had made a decree that no new convent of religious could be founded; 2, that no property or perpetual revenue of any kind should be bequeathed to the church without the approbation; 3, that clerical men accused of crimes should be judged by the secular power like other citizens. The pope, however, sent a 'sacramental' to Venice, and the court of Spain that of the Pope, and it was threatened with a war like that of the Investitures. Henri IV. of France however proposed his mediation, and sent to Venice Cardinal de Joyeuse, who, after due discussion, on the part of the senate, proceeded to Rome, where he succeeded in effecting a compromise. The decrees of the senate were maintained, but the two clerical curits, in compliance with the wish of the French king, were given up to the pope, 'saving the people from the impositions of all officers, clerical or lay, within its dominions.' Upon this arrangement being made, the interdict was removed.

In 1614 Pope Paul had a dispute with Louis XIII., on account of a book of the Jesuit Suarez, entitled *Defensio Sedis Papae.* The title *Sedis Papae* was too ambiguous, and he was told it was lawful to murder kings. This book was publicly burned by sentence of the parliament of Paris. The pope maintained that he was the proper authority to decide upon the contents of works concerning religious and moral doctrines,ought to be read, and was not to be burned by the councils. This affair was likewise settled by a compromise. The pope was in the meantime usefully employed in reforming many abuses in the tribunals and other offices of the Roman court, and in embellishing the city of Rome. In 1618 he died, having spent the most of his reign in the latter of these two objects, for his encouragement of the fine arts. He enriched the Vatican and Quirinal palaces, restored the church of Santa Maria Maggiore, constructed or repaired aqueducts, made additions to the Vatican library, collected statues and other things, b. 15. By his piety Paul beatified the saints of Borghese and Frascati. He established the fortune of the Borghese family, which is one of the wealthiest of the Roman families. Paul V. died in 1621, and was succeeded by Gregory XV.
to be paid to his father, together with the late empress, and for this purpose he had the coffin containing his body removed from the place where it had been deposited, and placed in the church by the side of the corpse of Catherine. Paul also went in person to release the Polish patriot Kosciusko, who was confined as a state prisoner, not however in a dungeon, as some have said, but in a private house, under a military guard, and he gave other property in London and the United States. He likewise liberated Pototsky and the other unfortunate Poles who were confined at Schlusselburg and other fortresses. These acts of the new emperor gave hopes of a more equal reign, but Paul's character, which showed itself in all its capriciousness and violence. He liked to interfere in the most minute details of police and of military discipline; he forbade the wearing of round hats in the streets of Petersburg; he likewise proscribed trousseurs and sashes, and sent forth orders for the suppression of all these absurd regulations. Any one who met him in the street was obliged to take off his hat, even in the severest weather, and ladies were required to alight from their carriages. For the former convenient dress of men was replaced by pantaloons, he substituted the German uniform, with tailed coats, spatterdashes, and queues bedaubed with grease and flour as being cheaper than powder and pomatum. This caused much discontent among the soldiers, who deserted and ran away, almost until they could no longer do so. Paul still remained in the Russian army. In the same spirit, Paul, whose only wish was to alter rather than to improve, remodelled all the departments of administration, and all the courts of the empire, in consequence of which thousands of civil servants were thrown out of employment. In his foreign politics Paul at first seemed disposed to adopt a system of neutrality in the great quarrel between France and the allied powers. But he soon became alarmed at the progress of the French army, and at the encroachments of Austria upon the Russian territory, besides in the Ionian islands, of Rome, Naples, Malta, and Egypt, determined him for war. He had an army of from 40,000 to 50,000 men assembled in Gallicia by Catherine, and he ordered it to join the allied march against Austria. Suwarow, the most distinguished general of Russia, who had been dismissed by Paul soon after his accession, for having expressed his sentiments in a letter to the emperor, was appointed to command the expedition. For an account of the former campaign in Italy, in 1778, see Sturgis. Another Russian army, 40,000 strong, under General Gorsakow, was sent to join the Archduke Charles in Switzerland. This army was defeated by Massena, at Zurich, in September, 1799. A third army was sent to join the Duke of Parma, in Holland, and the expedition also failed. A fourth Russian army was embarked in a fleet, which, joined to the Turkish fleet, conquered the Ionian Islands, and assisted in restoring the king of Naples to his continental dominions. In the end however, instead of driving the Austrian master of the order of St. John, across the Hellespont, he had marched into Switzerland to join his comrades there, arrived just after the defeat of Gorsakow, and was obliged to retreat through the Alps of Glaris into the Germanic states. He and his army were recalled by the emperor, and Suwarow arrived, desponding and in bad health, at Petersburg, where he soon after died. Paul, who had broken the heart of the veteran by attributing to him the defeat of the Swiss army, no part, retented towards him in his last moments, sent to inquire how he did, and allowed the grand-dukes, his sons, to go and visit him. Paul withdrew from the coalition without publishing his reason for it; he offended the allies, but in a manner made no proper use of his position to improve his character. He thus displeased everybody, and showed himself fickle, passionate, and weak. His private conduct partook of the same character. He became more stern and morose, showed suspicion of everybody, and was disliked by all. The soldiers detested him for his vexatious minuteness in discipline, the nobility for his rude and often cruel behaviour, and men of information for his proscription of books and journals. Paul chose to quarrel with England because she would not give up Malta. He had caused himself to be elected grand master of the order of St. John, and expected England to give up the island to him. After the battle of Marengo, Bonaparte bethought himself of profiting by the disposition of Paul, in order to gain his friendship. He accordingly collected all the Russian prisoners of war in France, dressed them, supplied them with muskets, and sent them back to Russia. This produced its effect, and Paul, who had proclaimed himself the champion of legitimacy, became all on a sudden a great admirer of Bonaparte. Paul's next step was to seek the English ships in the Black Sea, and other properties in the Dardanelles, because England had sent a fleet to Copenhagen in August, 1800, to oblige Denmark to acknowledge the navigation laws and the right of search of neutral vessels. In December of the same year, Paul cast锚ed a fleet with Sweden and Denmark, to which Sweden and Denmark, to which Russia soon after acceded, by which the right of search of neutral vessels was declared an attempt against the sovereign rights of the nation to which they belonged, and a squadron of the four Baltic powers was to be assembled to search vessels searching them. In consequence of this step England put an embargo upon the vessels of the Baltic powers. Paul now sent an agent to Bonaparte, and friendly communications were re-established between France and Russia. So Paul, publicly, 'can ally itself only with Russia, for Russia is the strongest; her protection is the key of India in her hands, and the emperor of such a country is truly a great prince. Paul is eccentric, but he has at least a will of his own.' (Thibaudau, Le Comte et l'Empire, ch. xiv.)

After these proceedings was concluded at Lunenburg between France and Austria, in February, 1801, Bonaparte secretly concerted with the court of Russia the plan of an expedition to India. Thirty thousand chosen French troops were to march into Poland, and these join an equal number of Russians, besides a large irregular cavalry, and thence the allied army was to proceed to the borders of the Caspian Sea, either to embark and cross that sea or march by the way of Persia, whose consent was not obtained. From Persia the allied army was to proceed by the sea route, and England had sent a fleet into the Baltic, under admirals Parker and Nelson, to dissuade the maritime coalition. On the 2nd of April, Nelson attacked the Danish fleet, and on the 4th an armistice was signed between Denmark and England. While the treaty was being concluded, news arrived of the sudden death of Paul, which happened in the night of the 24th of March. The Baltic coalition was thereby dissolved. A conspiracy had been formed among the officers near the person of the emperor, who went in a body on the night of the 24th of March to the palace of St. Isaac's, to abdicate sign, on the score of mental weakness. Paul refused, saying 'he was emperor, and would remain emperor.' A scuffle ensued, in which the unfortunate monarch was overpowered and strangled. His son Alexander then formally ascended the throne.

When the news arrived at Paris, Bonaparte was greatly vexed and mortified. Talleyrand, to calm him, observed that 'this was the customary mode of abdication in Russia. According to the practice of those times, the French papers intimated that England was privy to the conspiracy, but the fact is that the Russians had become weary of Paul's caprices, which bordered upon insanity, and the risk of forcing him to abdicate, though not of murdering him, appeared to them to afford the best means of procuring the accession of a person to the throne, who would not be a subject of interference by the other powers, and who should have the support of the people. A scuffle ensued in which the unfortunate monarch was overpowered and strangled. His son Alexander, then formally ascended the throne.'
PAUL

who was of the Servite order, this connection led him, contrary to the urgent advice of his uncle and mother, to adopt the same monastic rule and habit with his predecessor. In his twentith year he solemnly took the vows of the order. At the same period the ability which he displayed in a public disputation, held at Mantua, during a chapter of his order, attracted the favourable notice of the reigning prince of the house of Gonzaga, and he was appointed to the profection of the divine in the cathedral of that city. But though he was born of a noble family, and was elevated to the dignity of a Mantuan duke, a public life was little to his taste; and he shortly resigned his office and returned to the learned seclusion which he loved. In that retirement he continued to cultivate learning and religion; and in the thirty-third year, he had not only already mastered the Latin, Greek, Hebrew, and Chaldee languages, but was also proficient in the civil and the canon law, in various departments of philosophy, in mathematics and astronomy, in chemistry, medicine, and anatomy. In these various talents he came deeply versed for his times, and it has been alleged that he was acquainted with the circulation of the blood.

The claim of Sarpri to be considered the discoverer of the circulation rests on the authority of Vestilius, who states, in his history of the Venetian affairs, that the savages of Sarpri needed a manuscript by Sarpri, belonging to his pupil and successor Fulgenitus, in which the circulation was described. George Ent (Harvey's commentator and friend) admitted the testimony, but said that whatever Sarpri knew of the circulation, he took it from Harvey. Harvey's chief adversary, gives no credit for the discovery to Sarpri; and Fulgenitus himself does not claim it for him.

Several writers attribute to Sarpri the discovery of the circulation itself, which gave Harvey the first idea of a circulation; but Fabricius, the physician, of whom we hear in 1574, that Sarpri was but 22 years old, and it is certain that he (Fabricius) taught Harvey their existence.

The above is on the authority of Haller (Bibliotheca Anatomica), who does not attribute any part of the discovery to Sarpri.

The pursuit of such studies, and the renown which they procured for him, no less than the freedom of his expressed opinions in correspondence with the kindred minds of his age, did not affect his private life. The public envy and the private calumny which were directed against him, and which were sometimes indulged in, caused him to be twice arraigned before the Inquisition on a false and absurd accusation of heresy, and on a better-founded charge of having declared in a letter his detestation of the papal court and its corruptions. His high reputation procured for him a great influence in the Venetian Senate, to which he was elected at a very early age. When the Turks were defeated in the memorable battle of Lepanto, and the Venetians, who had been victorious, were about to celebrate the victory, Sarpri, as an expression of his approbation of the event, forbade the word 'victory' to be spoken; and at a subsequent period, he was able to command, with much severity and justice, the administration of his beneficent government, and to reduce the pretensions to practice by laying the Venetian state under an interdict and excommunication for having subjected priests to secular jurisdiction, the senate of Venice, not content with setting aside the papal weapons at defence, determined to support by argument the justice of their cause. The most eloquent and successful advocate whom they employed for this purpose was Father Paul; and animated both by zeal in the service of God and a love of his country, he opposed the Roman usurpation, he fulfilled his task with equal courage and ability. Though several cardinals and Jesuits furiously engaged in the controversy on the papal side, the fallacy of the pretensions which they attempted to uphold was so evident, that it was easy to shatter the arguments of the papal party. The success of the arguments of the papal party was due to the perseverance of the Jesuits and the ability of the Roman theologians of the time, and it is frequently mentioned in the Epistles of St. Augustine and St. Jerome. His works were published for the first time by Badius, Paris, 1616; but the best editions are by Muratori, Verona, 1736, fol.; and the same printed at Venice, 1737.

Paulinus, SAINT, patriarch of Aquileia, is chiefly known in ecclesiastical history for the exhortations he made in defence of the Trinity. He was born near Friuli, and was a pupil of St. Augustine. He was appointed patriarch of Aquileia in 767. He died in 804. His works have been published by Madri, Venice, 1737.

Paulinus, better known under the name of JOHN PHILIP WERDIN, was born near Mannesdorf in Austria, on the 8th of April, 1748. He studied philosophy and theology at Prague, and afterwards learned some of the oriental languages in the college of the Carmelites in Rome,
which order he had joined in 1769. He was sent to the coast of Malabar in 1774, where he remained for 14 years, and was successively appointed vicar-general and apostolic visitor. In 1790 he returned to Rome in order to superintend the religious works which were printed by the Propaganda for the use of the missionaries in Hindostan. He died without the title of martyr which he modestly declined.

Paulinus was one of the earliest Europeans who acquired a knowledge of the Sanscrit language. In consequence of his being settled in the south of Hindostan, he was not placed in such favourable circumstances as our countrymen in Bengal for obtaining an accurate knowledge of Sanscrit, since the Brahmins of the north are much more skilled in that language than those of the south. Paulinus however was very unwilling to admit his inferiority to the English scholars, and he frequently attacked them in his works. The character of Paulinus as a scholar may be seen from his published books, and especially from the Tanul character instead of the Devanagari, which is the character in which all Sanscrit works are written in the north of Hindostan, and which is employed in the Sanscrit grammars and works which have been published at Caleutta.

The Sanscrit Grammar of Paulinus was published at Rome, in 1790, under the title of 'Sidharubam, seu Grammatica Samsacramica, cum Dissertatione historico-critica in Linguam Sanscramicum,' and also in a fuller and different form, under the title of 'Sanskritam, seu Grammatica Sanscramica Linguis Instituto,' but both these works are entirely superseded by the more accurate and complete grammars of Wilkins and Bopp. Paulinus also wrote and edited many other works, of which the most important perhaps is 'Sanskrit Grammar,' published in 1794; 'Ceremonial Sacramental,' 1796; 'Amarasinha, seu Dictionario Sanssacramici sectio prima, de Deo; et tribus ineditis Codicibus Indiciis Manuscriptis, cum Versione Latina,' 1798 (the whole of this dictionary containing 460 pages); and 'De Latini Sermonis Origine et cum Orientalibus Linguis Connexione,' 1802.

PAULINUS SUETO'NIUS [Boldicea; Britannia]. PAULO, S. [Paulo, S.]

PAULUS AEGINETA (Παῦλος Ἁγινήτης), so called from his birthplace, the island of Aegina, in the Sinus Sannitica. He is one of the latest, and one of the most valuable of the ancient Greek medical writers, whose works are still extant. Abulfaráj (Hist. Dynast., p. 114, ed. Poucke) states that he lived in the seventh century a.d., which is probably somewhere near the truth, as he is mentioned by Trallius in cap. 58; and Wilkins lists him as a physician of the 7th century. In the same time he who is supposed to have lived about the middle of the sixth. Nothing is known of the events of his life, except that he travelled a great deal, as we learn from the two following barbarous Greek inscriptions prefixed to his work:

Παῦλον πάνων με γνωτίζω τοῦ γής τῆς παλαιοτάτου φίλον τοῦ ἤλεγχος.

It is on this account (as some think) that he is sometimes called εὐερετάρχης, but according to others, the epithet signifies 'qui obundis ergrutorum documentum edidit medicam faciit.' He appears to have visited Alexandria (lib. vii. cap. 17; and iv. 49); and it is probable that he travelled through Tripolitania, which is sometimes given him. Suidas says he wrote various medical works (lattae βιβλία διάφορα); and Abulfaráj, that he composed a treatise on medicine, in nine books, and one on female diseases. The latter work (if some parts of the first, third, and sixth books, which treat of that subject, and are not meant) is lost; the former still remains, with the title εὐερετάρχης lattae βιβλία Συπέρ, 'Compendia Medicis Libri Sive Systema.' As there is no reason for supposing this work to be imperfect, it is probable that each of the third and seventh books contains much more loss than the rest. It was divided by the Arabic translator into two. He appears to have been much esteemed by the Arabians, who, on account of his skill in midwifery and female diseases, called him All-Kasabeli, 'the accoucheur.' His remaining work is chiefly a compilation from Galen, Orbibnus, Aetius, and others; and indeed he tells us himself in the preface, that he means to supersede the short abridgment, by Orbibnus, of his own larger work, the 'Hedembomeconstitibib,' however it contains also a good deal of original matter, though he is sometimes too exact in repeating passages from the ancients. The following account of the contents of each book is given by himself in his preface, and the English translation by Mr. Adams has been adopted. 'In the first book you will find everything that relates to Hygiene, and to the preservation from and correction of disease peculiar to the various ages, seasons, temperaments, and so forth; also the powers and uses of the different articles of food, as we have explained in a summary manner. In the second is explained the whole doctrine of fevers, an account of certain matters relating to the digestive organs, and of other symptoms peculiar to the various parts of the body, and of the discharges, critical days, and other appearances, and concluding with certain symptoms, which are sometimes the consequences of fever.' The third book relates to topical affections, beginning from the crown of the head, and descending to the nails of the feet. The fourth book treats of those complaints which are external and exposed to view, and are not limited to one part of the body: also of intestinal worms and dracunculus. The fifth treats of the wounds and bites of venomous animals; also of the diseases which are caused by galls and scorpions. The sixth contains the diseases which are mad, and by those which are not mad; and also of persons bitten by men: among other things it treats of deleterious substances and the preservatives from them. In the sixth is contained everything relating to surgery, both exterior and interior. The seventh book contains the deadly poisons, and weapons; and to the bones, which comprehends fractures and dislocations. In the seventh is contained a description of the properties of all medicines, first of the simple, then of the compound; particularly of those which I have mentioned in the six books, and more especially of those greater, and, as it were, celebrated preparations. Towards the end are certain things connected with the composition of medicines, and of those articles which may be substituted for some others, and the whole concluding with an account of weights and measures.

The most valuable and original part of his work is the sixth book, which contains several descriptions of operations, either first mentioned there, or else with more accuracy and precision than elsewhere.

There is a minute and excellent account of bronchoasphyxia, taken from Antyllus (vi. 33). He recommends the jugular veins to be opened (vi. 40), and also in some cases the division of an artery (lodd.). He describes minutely and accurately the manner of preparing various medicines necessary for replacing the intestine (vi. 65). He notes that few persons, if any, recover if hydropobies comes on after the bite of a mad dog; and that if the wounded part be immediately cut out, there is but little danger if the wound be not a bad one (vii. 73). He describes the operation of making a pocket for the omentum (cap. 58; vii. 5, 11, 19), and anus (vi. 81). The work is also valuable as containing fragments of many authors whose writings are lost, such as Antyllus, Archigenius, and Dioscorides Carystius; the letter sent by the last writer to king Antigonus, entitled Ῥωμαίοις αὐτικοὶ πατρίς, 'Ad Valudinum Tuendum,' is inserted at the end of the first book.

The Greek text was first published, Venet., 1528, fol, in edib. Aldi et Andr. Alusani; the second and last edition, which is much superior to the former, was published, Venet., 1532, in ed. P. Andr. Gratiani. Hier. Gennanumus. There are three Latin translations of the whole work, besides several others of detached parts:—1. That by Albusius Torinus, Basii, 1532, fol., several times reprinted, together with the sixth book, which was omitted in the first edition; 2. That by Jo. Gummartus Andernacus, Parisiis, 1532, fol., much superior to the former, and several times reprinted; and 3. That by Jo. Cornaro, Basili, 1556, fol., accompanied by a valuable commentary, or (as he expresses it) 'dodallorum, sive castabarium librum septem dodaleatis, seu elaboratis et emendatis interpretatione et commentarii are inserted in the Medecina Artes Principis, Parisiis, 1567, fol., ap. Henr. Steph. An Arabic translation was made by the celebrated Hono Ibb Isak, better known perhaps by his Latinized name Joannitus (Biblic. Philológo, spad Chairet, Biblioth. Arabico-Hisp., tom. i., p. 286), which, according to Haller (Biblioth. Chirurg.), still exists somewhere in MS. There is a
PAULUS, JULIUS, one of the most distinguished of the Roman lawyers, was born in 154, and may be most conveniently referred to the time of the emperor Alexander Severus. The place of his birth is unknown. The reasons alleged for supposing him to be a native of Syria, namely, his intimacy with Ulpian, who was a native of that province, and a personage of some consequence, and the fact that he was a native of Paulus, an opinion founded on the fact of there being at Padus a statue which bears the name of Paulus; and the inscription is obviously comparatively recent. But the statue and inscription may refer to another person. The assumption, supposed to characterise his style, and his familiarity with the Greek language, have been adduced as arguments confirmatory of his alleged foreign origin.

Paulus was also a contemporary of Papinian [PAPINIAN], and was regarded rather his rival, than his pupil, as some writers have supposed. He was made praefectus pretorio by Alexander Severus, or, according to others, by his predecessor Elagabalus. He was banished by Elagabalus, but restored by Alexander Severus (Aurel. Vitt. c. 24); unless Victor, who seems to have confounded Paulus with Ulpian, (Lamprid. Elag. c. 16.)

Paulus was perhaps the most voluminous of all the Roman writers on law, and the extracts from his works contained in the Digest are no more numerous than those from any other writer. Except Ulpian, his chief contemporary, the Digest contains 2462 extracts from Paulus, and 2693 from Paulus. The proportion which each body of extract bears to the whole compilation is shown in the article JUSTINIAN'S Legislation.

Paulus wrote under the emperor Antoninus Caracalla and his successors to the time of Alexander Severus. His style, so far as we can judge from the extracts in the Digest, is concise, and sometimes obscure, owing to his leaving the reader to supply the gap in his arguments. Like the rest of the great Roman jurists, he was subtle in thought and clear and comprehensive in his judgments. He has been accused of violent hatred of the Christians, but the accusation is not supported by proof.

The breadth and width of the law of the works of Paulus: 80 books on the 'Edit', 26 books of 'Quaestiones', 23 books of 'Responsa', 23 books of 'Brevia', 5 books of 'Sententiae', dedicated to his son, 3 books on 'Adultery', &c. A complete list of the works of this laborious jurist is given by Paulus, August. (Paulus, August. De respons. jurisprudent. &c.) Of all these works there only remain the excerpts in the Digest, and the 5 books of the 'Receptae Sententiae', which are preserved in an imperfect shape in the compilation made by the order of Alaric II., commonly called the 'Breviarium.' A very full account of Paulus and his writings, by Bertrand, is contained in the Jurisprudentia Vetus Ante Justinianae of Schulting.

PAULUS AMILIANUS. [EMILIAN]

PAULUS [HINDUSTA], vol. xii., p. 293.

PAUN-AIR. [HINDUSTA], p. 298.

PAUPERISM AND POOR LAWS. The term pauper, according to the most convenient use of the word, is a person receiving legal relief. It thus comprehends those who, being without capital, but able and willing to labour, are unable to find permanent employment at rates of wages sufficient for their subsistence, and are wholly or partly supported by public funds. The term also comprehends orphans, bastard, and desert children who require and receive assistance from the charity of the household, or age, sickness, or infirmity, are disabled from labour, have no means of support, and receive legal relief.

It must be evident from this definition that in every country those who are properly called paupers are only one class or grade of the poor; that there are in the condition of poverty, the poor of a country, as distinguished from the paupers, may be distributed into three classes. 1. Persons without capital, who, being capable of labour, and finding employment, are able to obtain the means of subsistence. 2. Able-bodied mendicants, capable of labouring, who dislike work, and subsist by practising deceptions upon the humane and charitable. 3. Persons destitute through sickness, infirmity, desertion, or any other cause, and relieved by the charity of the country.

The causes of pauperism are numerous, and it would be equivalent to an attempt to explain most of the phenomena of modern society, if we should attempt to assign all its possible or even all its actual causes in any given country. Some of the causes are certain to be clearly traceable to positive law. Every civilized community has necessarily a great body of laws which concern the rights of property, and which regulate to some extent the conduct of the individual members of a community. It is difficult even for a wise legislator to attempt to provide against all the evils which may arise without doing some mischief by his interference; and the history of positive legislation in this and other countries shows that those who have had the power to make laws have not only ignorantly and unthinkingly injured society by not perceiving the tendency of their own enactments, but also by attempting to accomplish objects which they believed to be beneficial to society, but which an enlarged experience and a sound philosophy have proved to be detrimental to the general interest. When the object has been a good one, and a legislature has acted in accordance with ignorance of the proper means, in England legal interference with the condition of the poor has in some degree been exercised for nearly 500 years. In no country have greater efforts been made to regulate their condition, nor greater mistakes been made in this branch of legislation.

The great object of the earlier efforts in pauper legislation was the restraint of vagrancy. The 12th Richard II., c. 7 (1358), prohibits any labourer from quitting his dwelling-place without a testimony from a justice of the peace, on a cause reasonable and sufficient, or for going to the country. The 28 Henry III., c. 12 (1351), justifies were directed to assign to impotent poor persons a district within which they might beg, and beyond which they were forbidden to beg, under pain of being imprisoned and kept in the stocks for seven days. The able-bodied beggar is not to be whipped and forced to return to their places of birth, or where they had last lived for three years.

These acts appear to have had no permanent effect in repressing vagrancy. An act passed in 1538 (27 Henry VIII., c. 24) was the first voluntary one in the charter and the commonwealth, and it is repeated by 1 Edward VI., c. 3 (1547). Under this statute every able-bodied person who should not apply himself to some honourable labour, or offer to serve for even meat and drink, was to be taken for a vagabond, branded on the shoulder, and adjudged a slave for two years to any one who should demand him, to be fed on bread and water and refuse meat, and made to work by being beaten, chained, or otherwise treated. If he ran away during the two years, he was to be branded on the cheek, and adjudged
a slave for life, and if he ran away again, he was to suffer death as a felon. If not demanded as a slave, he was to be kept till he had labour on the highways in chains. The impotent poor were to be passed to their place of birth or settlement, from the bands of one parish constable to those of another. This statute was repealed three years after, and that of 1531 was revived. In 1551 an act was passed direct to the nobility; the book should contain the names of the householders and of the impotent poor; that collectors of sums should be appointed who 'should gently ask every man and woman what they of their charity will give weekly to the relief of the poor.' If they should refuse, the ministers and churchwardens were to exhort him, and, failing of success, the bishop was to admonish him on the subject. This act, and another made to enforce it, which was passed in 1555, were wholly impracticable, and the act of 1552 (3 Eliz. 2) with the addition that any person able to contribute and refusing should be cited by the bishop to appear at the next sessions before the justices, where, if he would not be persuaded to give, the justices were to tax him according to their discretion, and not his refusal to be taxed to gaol until the sum taxed should be paid, with all arrears.

The next statute on the subject, which was passed in 1572 (4 Eliz. 3), shows how ineffectual the former statutes had been. It enacted that all rogues, vagabonds, and such like beggars, in the atonement of him who under the pretence 'all persons whole and mighty in body, able to labour, not having land or master, nor using any lawful merchandise, craft, or mystery, and all common labourers, able in body, loitering and refusing to the same reasonable time to work,' should be 'for the first offence begravely whipped, and burned through the girtle of the right ear with a hot iron of the compass of an inch about;' for the second, should be deemed felons; and for the third, should suffer death as felons without benefit of clergy. For the concurrence, and sustentation of the aged and impotent poor, the justices of the peace within their several districts, were 'by their good discretion' to tax and assess all the inhabitants dwelling therein. Any one refusing to contribute was to be imprisoned. If they did not comply, the statutes 39 of Elizabeth, c. 3 and 4 (1598), every able-bodied person refusing to work for the ordinary wages was to be 'openly whipped until his body be bloody, and forthwith sent, from parish to parish, the most strait way to the parish where he was, and there to put himself to labour as a true subject ought to do.'

The next act on the subject, the 43 Elizabeth, c. 2, has been in operation from the time of its enactment, in 1601, to the present day. An entire change in the mode of life and the habits of the people had greatly profited. It was however effected by the Poor Law Amendment Act (4 and 5 Wm. IV., c. 76), which was passed in 1839. During that long period many abuses crept into the administration of the laws relating to the poor, so that in practice their operation was unwholesome, and injurious to the welfare of the whole country. In its original provisions the act of Elizabeth directed the overseers of the poor in every parish to 'take order for setting to work the children of all such parents as shall not be thought able to maintain their children,' as well as all such persons as, having no means to maintain them, use no ordinary trade to get their living by. For this purpose they were empowered 'to raise, weekly or otherwise, by taxation of the person, venue, and other occupier of lands, houses, tithe, mines, &c., such sums of money as they shall require for providing a sufficient stock of flax, hemp, wool, and other ware or stuff, to set the poor on work, and also competent sums for relief of lame, blind, and other disabled persons, and for other out of school education and apprentices.' Power was given to justices to send to the house of correction or common gaol all persons who would not work. The churchwardens and overseers were further empowered to build poor-houses, at the charge of the parish, for the reception of the impotent poor only. The justices were further empowered to assess all persons being of sufficient ability, for the relief and maintenance of their children, grandchildren, and parents. The parish officers were also empowered to bind as apprentices any children who were unable to be employed in the parish.

These simple provisions were in course of time greatly perverted, and so many abuses were practically engulfed upon the statute, that it became an instrument of more general demoralization than was ever sanctioned by legal enactments. The severity of the law has, in every part of the country, made the poor-burser in proportion to the number of his family, and without reference to his being employed or without employment. This allowance fluctuated with the price of flour, and the scale was so adjusted as to return to each family the same amount of provisions in years of ordinary abundance. This plan was doubtless conceived in a spirit of benevolence, but the readiness with which it was adopted in all parts of England clearly shows the general want of sound views on the subject. If ignorance be the cause of this, it would greatly need a new resolution to provide for the religious instruction of the clergy in Scotland, the labourer's wages would have enabled him to purchase the same or nearly the same amount of provisions and other articles of necessary consumption as before the advance, and when the necessity for such a rise in wages without a corresponding rise in the price of the necessaries of life.

There are no accounts of the sums levied year by year in England and Wales for the relief of the poor, before the beginning of the present century. The average expenditure for relief was not less than 1,401,871L., the earliest account after that date is for 1801, when the expenditure amounted to 4,017,871L. The assessments have been more than doubled in 17 years. It will be seen from the following table how little connection there has been between the sums expended for relief and the price of corn:

<table>
<thead>
<tr>
<th>Years</th>
<th>Sum expended for Relief.</th>
<th>Average Price of Flour per Quarter</th>
<th>Sum expended for Relief.</th>
<th>Average Price of Flour per Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1801</td>
<td>4,017,871L.</td>
<td>115 11</td>
<td>1826</td>
<td>5,928,501L.</td>
</tr>
<tr>
<td>1803</td>
<td>4,077,891L.</td>
<td>57 1</td>
<td>1827</td>
<td>6,441,088L.</td>
</tr>
<tr>
<td>1804</td>
<td>6,560,106L.</td>
<td>95 5</td>
<td>1828</td>
<td>6,296,600L.</td>
</tr>
<tr>
<td>1814</td>
<td>6,294,391L.</td>
<td>72 1</td>
<td>1829</td>
<td>6,332,410L.</td>
</tr>
<tr>
<td>1824</td>
<td>6,384,471L.</td>
<td>72 1</td>
<td>1830</td>
<td>6,384,471L.</td>
</tr>
<tr>
<td>1835</td>
<td>5,724,783L.</td>
<td>76 2</td>
<td>1831</td>
<td>7,696,885L.</td>
</tr>
<tr>
<td>1846</td>
<td>6,910,925L.</td>
<td>70 1</td>
<td>1832</td>
<td>7,036,958L.</td>
</tr>
<tr>
<td>1856</td>
<td>7,870,801L.</td>
<td>83 8</td>
<td>1833</td>
<td>7,690,799L.</td>
</tr>
<tr>
<td>1866</td>
<td>7,416,704L.</td>
<td>63 3</td>
<td>1834</td>
<td>7,317,245L.</td>
</tr>
<tr>
<td>1876</td>
<td>7,336,906L.</td>
<td>65 10</td>
<td>1835</td>
<td>7,526,418L.</td>
</tr>
<tr>
<td>1886</td>
<td>8,599,249L.</td>
<td>54 5</td>
<td>1836</td>
<td>7,417,730L.</td>
</tr>
<tr>
<td>1896</td>
<td>6,358,702L.</td>
<td>43 3</td>
<td>1837</td>
<td>7,044,741L.</td>
</tr>
<tr>
<td>1906</td>
<td>5,772,958L.</td>
<td>31 9</td>
<td>1838</td>
<td>7,057,541L.</td>
</tr>
<tr>
<td>1916</td>
<td>5,786,059L.</td>
<td>66 6</td>
<td>1839</td>
<td>4,261,714L.</td>
</tr>
</tbody>
</table>

The extent to which the pauperism of the labourers in England was carried had long been viewed with alarm, and had formed the subject of many parliamentary inquiries. In 1800 a commission was appointed by the crown, consisting of the bishops of London and Chester, Mr. Sturges Bourne, Mr. Senior, and five other gentlemen, under whose direction enquiries were carried on throughout England and Wales, and the actual condition of the labouring classes in the rural parishes was ascertained with the view of showing the evils of the existing practice, and of suggesting some remedy. The labour of this inquiry was exceedingly great, but in a comparatively short time a Report was presented by the commissioners, which was accepted by the crown, and from its provisions the poor law was amended, with its effects upon different classes, and suggested remedial measures. This Report was presented in February.
1834, and was followed by the passing, in August, 1834, of the Poor Law Amendment Act, in which the principal recommendations of the commission were adopted and made law. The chief provisions of this law are the appointment of a central board of three commissioners for the general superintendence and control of all bodies charged with the management of funds for the relief of the poor. The further appointment of nine assistant-commissioners, one of whom should be attached to some particular district, in order to carry out practically the orders of the central board; the whole to be subject to the direction of the secre-
tary of the department. The administration of relief to the poor is placed under the control of the com-
missoners, who make rules and regulations for the purpose, which are binding upon all the local bodies. They are em-
powered to order workhouses to be built, hired, altered, or enlarged, with the consent of the majority of the board of guardians. One very important power given to them is that of uniting several parishes for the purposes of a more effective and economical administration of poor relief, but so that the actual charge in respect of its own poor is defrayed by each parish. These united parishes, or unions, are managed by boards of guardians annually elected by the rate-payers of the various parishes, but the masters of workhouses and other paid officials are under the orders of the commissioners, and not by them. The system of paying wages partly out of poor-rate money was continued, but, in ordinary cases, as to which the commissioners are the judges, relief is only to be given to able-bodied persons or to their families within the walls of the workhouse. Another branch of the law was that which, so far as the law of 1834, was that relating to illegitimate children. The system of relief which was previously followed was so far from acting as a check on bastardy, that it was actually a great encouragement to it. On the birth of a bastard child, the parish offic-
ers generally obtained an order of affiliation upon the putative father, and the money paid under that order was often abusively received by the mother. In this manner a woman of loose habits was placed in more comfortable circumstances than as a virtuous woman; she was even sought in marriage as a prize, and her equal partners in the act of delinquency. Having no such allowance, had no chance of making a second marriage. Under the new law, the facilities for ob-
taining orders upon putative fathers are diminished, the mother and child are generally relieved in the workhouse, and the money paid under the order is always received by the parish-officers and accounted for by them. The opera-
tion of this part of the law may have been productive of hardship in some cases, and it is objected that it sets little reliance on the self-help of the deserving poor, but there is not a diminution in a sensible degree the proportion of illegitimate births chargeable to the parish. These are the principal provisions of this very important state-
ment, which, upon a careful review of all the facts which have preceded the presentation of plans for the management and instruction of children resident in workhouses. Under the administration of the amended law little or nothing was done towards this object, and in almost every case the child whose misfortune it was to be brought up at the charge of the parish, continued through life dependent upon others for subsistence, and often fol-
lowed a course of systematic dishonesty. Moral criminality in such cases might be more fairly chargeable against so-
ciety, which had neglected to give a proper direction to the young pauper's habits, than against the individual delin-
quent; and society has paid dearly for the neglect. The system of moral, intellectual, and industrial training which has been to some extent engraven upon the administration of the amended law, is calculated to enable the children of the workhouse to be useful members of society. It has been well observed in a Report on this subject drawn up by Dr. Kay, that the state is in loco parentis to the pauper children who have no natural guardians, and the interest of the community in the efficient discharge of its duties is well illustrated by supposing the government had determined to require direct instead of indirect service in return for edu-
cation. If the army and navy were recruited by the work-
house children it was not only in the public interest that the state to rear a race of hardy and intelligent men—in-
structed in the duties of their station—taught to fear God and honour the Queen. The state has not less interest, though it may be less apparent, in supplying the merchant service with sailors, and the manufacturers of the country with workmen, and the households of the upper

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however to suffer a more lingering death. He was shut up
in the temple, and, when on the brink of starvation, was
saved only by the Spartan superintendence, and the actors in the tragedy held themselves innocent of sacrilege. Thirty-five years after, a contest
arose on this very point. [Pericles.]

The Hippodrome of Constantinople still contains, although
safely mutilated, the brazen tripod which Pausanias dedi-
cated at Delphi, with an inscription to the effect that it was
in gratitude for having destroyed the Persian host.

(Thucyd., i. 132, G.; Gibbon's Decline and Fall of the
Roman Empire, vol. iii, ch. 17, p. 52, ed. v. 1, note, and
Clark's Pr. Ant. vol. i. 52.)

Pausanias, the author of the Description or Itinerary of
Greece,' (ἐλλάδας περίηγησις), appears, according to his
own account, to have been a native of Lycis (v. 12,7); but
his story is hardly proved. Little else is known of him, except what may be collected from his own work.
The Description of Greece consists of ten books: the
first contains the description of Attica and Megara;
the second, Corinthis, Sicyon, Phlius, and Elis; the
third, Laconia; the fourth, the nine states of Arcadia
Elis; the seventh, Achaea; the eighth, Arcadia; the ninth,
Boeotia; and the tenth, Phocis.

It appears from incidental notices in the work, that
Pausanias not only visited the places which he described,
but also wrote copiously about them, the names of
many of his journeys and the titles of his books. He must
have been at the temple of Ammon, in Libya (ix. 16, 1); at
Crete (ix. 40, 3); in the island of Delos (v. 12, 3); and at
Cyprus (v. 16, 3). A traveler who visited all these places
would have had nothing to add to Pausanias's description of
the temple of Zeus in the time of Antinous.

In speaking of the Odeion of Herodes, he says that
he had not described it in his account of Attica (i.), be-
cause it was not built when he was writing that part of his
work. He was then, he says, thirty years old, and had
died in Attica about the end of the reign of M. Aurelius.

The work of Pausanias is different in character from that
of Strabo: it contains no general geographical description
of the surface of the country; it is a description of place
only. He describes the sanctuary of each deity in each
state, and gives a full account of the buildings in each,
with the fewest possible details of ornament and
architectural style.

The text is replete with the names of objects in each place in the order in which it comes before him. His description is minute and generally complete:
he seems to have busied himself as a man would do if he
were making an inventory or catalogue. There is no attempt
at generalization or classification. The arrangement of
objects in each place is the order in which he met them.
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The most famous work of Pausias was the sacrifice of an ox, which in the time of Pliny was in the hall of Pompey. In this picture the ox was foreshortened, but to show the animal to full advantage, the painter judiciously threw its shadow upon a part of the surrounding crowd, and he added to the effect by painting a dark ox upon a light ground.

Pausias in his youth loved a native of his own city, Glycera, who earned her livelihood by making garlands of flowers and wreaths, which led her to become familiar with her, and he eventually acquired great skill in flower painting. A portrait of Glycera with a garland of flowers was reckoned amongst his masterpieces; a copy of it was purchased by L. Calpurnius Piso at Athens, at the great price of two talents (about 432L). This picture was known as the 'Stephanoplocos,' or garland wreather. Pausias was reproached by his rivals as being a slow painter, but he silenced the censure by completing a picture of a boy, in his own style, in a single day, and as a sign of his proficiency he termed the 'Hemeress, or work of a day. (Pliny, Hist. Nat., xxxv. 11, 40.)

Pausias mentions two pictures by Pausias at Epidaurus, the one a Cupid with a lyre in his hand, his bow and arrows drawn by his side; the other is a picture of Melete, or at least, drinking out of a glass, through which his face was seen (ii. 27). Pliny mentions two pupils of Pausias, his son Aristolaus, a painter 'e severissima,' and a certain Mechopaenes, who was distinguished for a high finish and an extreme use of yellow, and was, it seems, not much esteemed by his admirers notwithstanding these peculiarities. We may collect from the allusion of Horace (Sat., ii. 7, 93) that the pictures of Pausias were well known at Rome.

PAUSE. [Oxycraea.]

PAUSSIADÆ, a family of Coleoptera, insects, the precise affinities of which have not yet been satisfactorily determined. By Latreille the PauSSIDÆ are placed between the Scolytidae and the Bostrichidae; but Mr. Westwood who has devoted much labour to the group of these, and has published a monograph on them in the sixteenth volume of the 'Linnean Transactions' is of opinion that the PauSSIDÆ possess affinities with the Trogostatus, and are still more nearly allied to the Cucujides.

These insects are small, and the largest known species being less than half an inch in length, and their colouring generally consists of various shades of brown, and they are not unfrequently adorned with black markings. The form of the body is generally short, rather broad, and somewhat depressed; the head, in most of the species is protractable (i.e. not hidden by the thorax), and joined to the thorax by a kind of neck. The thorax is narrower than the elytra, and is almost always divided transversely near the middle by an indentation, in which case the fore part is usually broader than the hinder part; the sides of the thorax are occasionally furnished with a small tubercle. The legs are in most species broad and compressed, and of moderate length; the tarsi are five-jointed in some, and apparently in others there are but four. The antennae are remarkable for their large size and curious forms; in most of the species they consist of a large inflated club, about equal in size to the head and thorax taken together, and varying in form according to the species: the most common form of this knob is that of an oval more or less elongated, and with an angular projection at one end. The insect as a whole is generally adapted for climbing, and is used in the same manner as the species of Brachinus.

The family PauSSIDÆ contains the six following genera:
PauSSIDÆ, Hylioturus, Platyrhopalus, Ceropæus, Entopæus.
tarthrus, and Trochoides. In the first three of these genera the antennae are two-jointed, and the abdomen is of a quadrato-form.

The genus Pausus is distinguished by the absence of ocelli on the head, and by the ultimate joint of the labial palp being elongated.

In Hylotarsus the head is furnished with two ocelli, and this genus differs from Pausus in having the head more compressed in the thorax; the great club of the antenna is thickest at the base, and somewhat curved and pointed at the opposite extremity.

Palaechthopalus has all the essential characters of Pausus, but differs in having the joints of the labial palp equal.

In the genus Ceratopterus the antennae are large, broad, and compressed, and appear to be composed of ten joints, most of which are very distinct; the terminal joint is the largest; the preceding joints (if we except the basal one) are transverse and of all equal width.

In Pentatubarthrus the antennae gradually increase in size from the base to the apex, and are composed of six joints. The basal joint is longest and broad; the second is transverse; the three following joints are nearly equal in width and length, and the terminal joint is almost spherical.

The genus Trochodorus differs from all the preceding genera in having an oval form of body; the thorax is rather narrower than the elytra; its sides are rounded, the broadest part in front, and there is apparently no transverse indentation. The head is large and rounded, and deeply inserted in the thorax. The antennae are composed of five or six joints, and are represented by a pair only, excepting the basal one, and terminate in a large oval club. The legs are more slender than in other species of this family, and the tarsi are represented as having only four joints.

PAUL CORNELIUS, born at Amsterdam in 1739, studied at Göttingen, and was afterwards made canon of Xanten, in the duchy of Cleves. He applied himself to literature, and wrote several works in French on the history and physiology of various nations and countries. His Récherches sur les Guerres de M. de Mauguin (1791), contains curious information, many sensible reflections, and also many unsupported assertions set forth in a dogmatic tone. Pauw had not visited America, and his object seems to have been to collect all the passages which he could find in other writers, and which could support Pauw's preconceived opinion of his concerning the great inferiority of that part of the world, its productions, and its native races. (Pernety, Dissertation sur l'Amérique et les Américains contre les Réseaux de M. de Mauguin, Paris, 1791, p. 82-85.)

In his chapter on Paraguay, Pauw shows himself particularly hostile to the Jesuits. His Réseaux sur les Guerres, in which he had better guides, is written with greater sobriety of judgment; but his manner, his dogmatism, his philosophy, Pauw published also Réseaux sur les Égyptiens et les Chinois. The French Revolution, and the subsequent invasion of the duchy of Cleves, deprived Pauw of his peace of mind. He became dejected, and burnt all his papers, among others his Réseaux sur les Germaines, which is said to have been the most elaborate of his works, but which was never printed. He died at Xanten, in 1799.

Another member of the same family, John Cornelius Pauw, born at Utrecht towards the end of the seventeenth century, was a good classical scholar, published editions of several Greek classics, and wrote notes on Pindar, and also a 'Distribre de Ale Veterrum.'

PAULI. [Cranz, vol. viii., p. 129.]

PAULIUS DE BORROMEO, ROMA.

PAVIA, THE PROVINCE OF, in the Lombardo-

Venetian Kingdom, is bounded on the north by the province of Milan, on the east by that of Lodi, west by the Sardinian territory, from which it is separated by the river Ticino, and partly by the Sardinian territory and partly by the duchy of Parma, being separated from both by the Po. The province of Pavia is the smallest of the Lombard provinces, but it is one of the most fertile, being entirely in the fine plain of the Po. It produces corn, wine, hemp, and has good pasture land. The length is about 40 miles from north-west to south-east, but the breadth does not exceed 10 miles. The population amounts to 157,800 inhabitants. (Bollettino Statistico di Milano 1838.) The province is divided into eight districts: Pavia, Belgioioso, Bereguardo, Corte, Olona, Rosate, Binasco, Albiate Grasso; reckoning in all 193 communes. There are 50 parishes, which are an essential part of the province, and numerous large villages. Two navigable canals, the Naviglio Grande and the Canale of Pavia, cross the province, and supply a water communication between Milan and the Lago Maggiore and the Ticino and Po, and by the latter river to the sea.

PAVIA, THE TOWN OF, is situated on the left eastern bank of the Ticino, a few miles above its junction with the Po. A handsome covered bridge over the river connects Pavia and the suburb on the right bank, called S. Giorgio, the two distances of the bridge length leads to this bridge. The cathedral, which is a modern structure, was rebuilt in the last century; it contains some good paintings. The oldest church in Pavia, and the first church built was a tower of St. Gotthard, which is asserted by D'Agincourt, Rosmini, and other authors, to have been built in the sixth century of our era; whilst another writer, San Quintino (Dell' Architettura Italiana durante le Dominazioni Longobardiche, Bologna, 1789), maintains that the old church was built together with the greater part of the town, by the Hungarians in the early part of the tenth century, and that the present church was built in the eleventh century. Several old and curious basilicae adorned this church, as well as some towers of the college of St. Gotthard, which the outer wall of the church seems to belong to an early period of the Longobard dominion in Italy, when that nation was still Arian; it represents the announcement of the Verga. a very low building, which is said to have been grown up. (Voyage, Voyages en Italie.)

If this be a correct statement of this monument, it would go far to prove that the church really dates from the sixth century, before the Longobards forsook the Arian creed through the influence of Theodoric. The town of Pavia was built in the fourteenth century, contains some valuable paintings. That of Santa Maria Corona was built by Bramante, and is also rich in paintings. The town of Pavia is also a residence of the Bishop of Pavia, who is the bishop of the town of Pavia, and the head of the diocese of Pavia.

In the same church of San Pietro the mausoleum of Luitprand, one of the most illustrious of the Longobard kings, which has also disappeared.

The city is destroyed by fire in 1537. For its university, the first in Italy, which, among its professors in our own times, can boast of the names of Scarpa, Volta, Confuciani, Brugnana, Tamburini, and other distinguished men. The university contains thirteen colleges; and the faculties are those of law, medicine, arts, and the colleges of the arts. It is a free and untrammeled, and the professors are well remunerated, several chairs, such as those of statistics, diplomacy, history of philosophy, and pedagogy, have been added of late years. Pavia has long been renowned for its medical and surgical instruction. The former library of the university was plundered by the French in the wars of Louis XVI. and Francis I.; the present library was formed in the last century by Count Firmian, the enlightened minister of the empress Maria Theresa, who was the restorer and patron of the university. A museum of natural history, a cabinet of anatomy, and a botanical garden are annexed to it. The number of students is about 1400. Three colleges, Cacetti, Borromeo, and Ghislieri, the first two founded by Cardinal Cesare Borromeo, and the third by Pope Pius V., support about 120 students gratuitously. The college Borromeo is a magnificent building. Further details concerning the university of Pavia are given in Nos. 5 and 16 of the 'Quarterly Journal of Education.' Pavia is one of the Neapolitan cities. It is a bishop's see, has a large hospital, a house for foundlings, and other benevolent institutions. Several palaces of the nobility contain galleries of paintings.

Pavia, called Ticianna by the Roman writers, was a town of Caspius Gaul, and the seat of the fourth of it in Roman history. The name of Pavia, or Pavia, is first mentioned in the history of the Longobards, who made it the residence of their kings, whose palace however no longer exists. It went through the same as the other Lombard
towns; was a republic, afterwards had its tyrants, then became subject to the dukes Visconti of Milan, and lastly came under the dominion of the House of Austria. It was near Pavia that Francis I. was defeated and taken prisoner by the troops of Charles V. in 1525. In the years 1527 and 1528, it was twice taken and plundered by the French, and almost entirely depopulated. In 1796, after Bonaparte had invaded Lombardy, an insurrection against the French broke out at Pavia, which was put down by force, and the town given up to pillage. Five miles distant from Pavia, on the road to Milan, is the splendid Carthusian monastery suppressed by Joseph II., which had an income of about one million of livres (40,000l.). It was built by Gian Galeazzo Visconti, duke of Milan, whose monument is in the church; the church is rich in sculptures, marble, and fresco paintings.

(Le Cortoza di Pavia descritta ed illustrata con Tavole, by Dorelli, fol., Milan, 1523-30.)

PAVIA is a small division of the natural order Aviculo- crusulacae, differing from Crusulaceae itself in little except its con- verting petals and spineless fruit. It consists of small trees or bushes with yellow or red flowers, inhabiting North America, and often cultivated in shrubberies under the name of the Yellow or Scarlet Horse-chestnut. Two species, P. indica and Punduana, have also been found in the colder parts of India, but they have not yet been introduced into our gardens. With us the American species are usually short-lived and of no value for their timber; the former circumstance is probably due to the bulbs being planted upon the common horse-chestnut, a stock that does not suit them. They should always, if possible, be raised from seeds, which are annually imported from the United States.

PAVON (Rood). PAVO (the Peacock), a constellation of Bayer, which occupies a part of the space situated between Sagittarius and the South Pole. Its principal stars are as follows:—

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PAVONIDE, Peacock family, Mr. Swainson’s name for a family of Raptorial birds.

The genus Pavo of Linnaeus stands next to Didus [Dono] in the Systema Naturae, and is immediately succeeded by Melagris, which is followed by Crax, Phasianus, Numida, and Tetrao.

Mr. Vigors admits no such family as Pavoide into his group of the Raptorial, but its name is supplied by the Phasianidae, a family which does not exist. Mr. Swainson’s system. Mr. Vigors enters the family of Phasianidae by the genus Melagris, leaving the Columbidae by the Crowned Pigeon of India (Lophura, Vieill.), which possesses the strongly formed legs found in Melagris, but without the spur, while at the same time it retains the bill of Columba. Melagris, then, in conjunction with Pavo, Linna., and Polyplectron, Temm., commences Mr. Vigors’s group of Phasianidae, by the greater length of the hinder toe, in which character it is probably the Columbidae, with the exception of its being articulated higher on the tarsus. Lophura, Temm., and Gallus, Brisson, appear to Mr. Vigors to hold an intermediate station between the groups just mentioned and the true Phasianus, which, in his opinion, forms the type of the family. Some groups deviating from the latter genus (Argus, Temm., for instance) unite themselves, he thinks, to Numida, Linna., by the absence of the spur on the tarsus. The last-mentioned genus reconciles us, according to his view, to Melagris, which it resembles in general appearance; while, at the same time, it approaches it with reference to the integrity of the tarsus, that of the true Melagris possessing but a short and blunt excrescence, which exhibits only the rudiments of a spur. (Linn. Trans., vol. xiv.)

Cuvier makes his Pons consist of the true peacocks (Pavo, Linna.) and Lophophorus. This group is followed by the Dindons (Melanotis, (Nomida, Linn.); and the Psasins (Phasianus, Linn, including the cocks and hens (Gallus, Briss.); the true pheasants (Phasianus Colchicus, &c., including Argus, Temm.); the crested pheasants (Hoopäftpõs, Temm., Phasianus ignitus, &c.); the Tragopan (Tragopan, Temm.; &c.); and Cryptophasa. The Tetraonide immediately follow.

Mr. Swainson makes the Pavonide, the first family of the order Rationes, according to his arrangement, consist of the genus Pavo, with the subgenera Artheus, Polyplectron, and Melagris; the genus Phasianus, with the subgenera Phasianus, Nycthemerus, and Ceriornis (Tragopan); the genus Gallus; the genus Lophophorus; and the genus Numida.

Mr. C. R. Gray makes the Pavonide (the first subfamily of the Phasianidae, according to his arrangement) consist of the genera Polyplectron, Crotaphiopus, Hodgson (type C. Tibetanus, and Pavo. The fourth subfamily, according to the same author, is composed of the genera Melagris, Numida, Guttera, Lophura, and Crotaphiopus sulcatus, Hardw. (List of the Genera of Birds, 1840.)

In this work, Phasianus, with its subgenus, Tragopan, Gallus, and Buplocamis, are treated of under the title Pheasants.

Pavo. (Linna.)

Generic Character.—Bill convex, rather stout, curved towards the end, smooth at the base; cheeks partially naked; nostrils basal and open; head plumed and surmounted with an argenteal crest; with quill longest; tail-feathers eighteen; tail-coverts very long, large, and eminable in the male.

Two species only of this magnificent genus are recorded. One, Pavo cristatus, the Common Peacock, is universally well known.

The head is surmounted by an argenteal of forty and twenty upright feathers. In the male the tail-coverts consist of feathers with loose bars and of unequal size, the upper ones shortest, each terminated by numerous eyes or circles of a metallic iridescence; in the female the bird has the power of erecting into a circle or wheel, which presents, when the sun shines on it, an object of dazzling splendour which sets all description at defiance. The female has the argenteal, but has not the splendid ornament with which the male is gifted; her tail-coverts generally shorter.

People usually talk of the peacock spreading its tail, but the rich display is composed, principally, of the tail-coverts. While soon saw the distinction. ‘Having to make a visit to my neighbour’s peacock,’ he says he, ‘help-observing that the trains of those magnificent birds appear by no means to be their tails, those long feathers growing not from the uropygium, but all up their backs. A range of short brown stiff feathers, about six inches long, fixed in the uropygium, is the real tail, and serves as the usherer to prop the train, which is long and top-heavy when set and end. When the train is up, nothing appears of the bird but its head and neck; but this would not be the case were these long feathers not the only in the body carried by the turkey-cock when in a strutting attitude. By a strong muscular vibration these birds can make the shafts of their long feathers clatter like the swords of a sword-dancer; they then trample very quick with their feet, and run backwards towards, and face each other.’

This species is spread over the north of India and the islands of Malasia in its natural state. It is the Mohr of the Maharratas, according to Colonel Sykes, who describes the wild bird as abundant in the dense woods of the Ghauts; it is readily domesticated, and many hindu temples have Dukhuan (Deccan) hare, he tells us, considerable flocks of them. On a comparison with the bird as domesticated in Europe, the latter, both male and female, was found by the Colonel to be identical with the wild bird of India. The Colonel Williams, in his account of peacock-shooting, states that he had seen about the passes in the Jungletry district surprising quantities of wild pea-fowls. Whole-
woods were covered with their beautiful plumage, to which the rising sun imparted additional brilliancy. Small patches of plain among the long grass, most of it cultivated, and with mustard, then for a pumpkin, which induced the birds to feed, increased the beauty of the scene. 'I speak within bounds,' continues Colonel Williamson, 'when I assert that there could not be less than twelve or fifteen hundred peafowls, of various sexes, within sight of the spot where I stood for two or three hours.'

According to the same authority it is easy to get a shot in a jungle, but where the birds flocked together, which they do to the amount of forty or fifty, there was greater difficulty in being successful, for the course was raised, and in some parts very fast, so fast indeed, that the Colonels doubt whether a skilled and accomplished marksman could make them take wing. They fly heavy and strong, generally within an easy shot: if winged only, they generally escape from their swiftness of foot. They roost on high trees, into which they fly towards dusk.

This is the 

raim (Teon) and raim (Theek) of the Greeks; 
Pavon and Pavo of the ancient Italians; Pavon, Pavone, and Pajone of the modern Italians; Pavo of the French; and Pavo of the Germans.

Buffon and others say that the bird was introduced into Greece, whence it has been spread throughout Europe, in the time of Alexander the Great. Others again, with greater show of reason, assert that it was brought to Greece before the time of Alexander. Certainly, the most ancient classical references to the孔雀 are mentioned in two plays of Aristophanes, the 'Acharnians' and the 'Birds,' the first of which was represented in the third year of the 88th Olympiad, and the last in the second year of the 91st. Now Alexander was not born till the 2nd Olympiad of the 88th Olympiad. But there are references from other old poets—Eupolis, for instance; nor does Aristotle speak of the bird in any other terms than those which would indicate that it had become very well known when he wrote: 'Some are jealous and vain like the peacock,' says he. All these things are indications of this bird's qualifications exhibited by certain animals. (Hist. Anim. 1. 1.)

Sir Robert Heron gives the following interesting account of the habits of these birds in a domesticated state:—1814.

For a good many years I have attended the habits of Pavo cristata, and the last eighteen have written my observations. I find the individuals to differ as much in temper as human beings: some are willing to take care of the young ones of others, whilst some have pursued and killed them, and this whether they had a brood of their own or not. Some cocks have assisted in the care of young ones, whilst others have attacked them. An early hen frequently has a brood herself the next year. Age makes no difference in the number of the brood. I have had six from a hen a year and more. One old hen, who has been frequently observed, I believe was the same hen. In the autumn, the oldest of the hens instantly courted him, and obtained proofs of his love in my presence. The next year he was shut up in a stable, and the hens then all courted his rival; for the advances in these birds are always made by the female.

'The Japanese breed are, I believe, a variety originating in England. In Lord Brownlow's numerous breed of common, white, and pied, the Japanese suddenly, in my memory, first appeared. They are first mentioned in Sir J. Travell's Flora of the ornamental garden, also in a breeder of common and pied given by Lady Chatham to Mr. Thornton; and in both cases to the extinction of the previously existing breed. (Zool. Proc., 1853.) The common breed is a large bird, with a long neck, and rather precocious. The Japanese breed are not varied, and one entirely white. In this last the eyes or circles of the train are shadowed out, as it were. The female, like those of several other gallinaceous birds, is subject to putting on the plumage of the male when unwell for months together. There are two species. Thus Lady Tynan had a favourite pied pea-hen, which had produced chickens eight times. John Hunter relates that this bird having moulted about eleven years old, the lady and family had for a year been astonished by her displaying the feathers peculiar to the other sex, and according to her peculiarities this process the tail (train), which became like that of the cock, first made its appearance after molting. In the following year, having moulted again, she produced similar feathers. In the third year she did the same, and, in addition had spurs resembling those of a cock. She never bred. Here is a change of plumage, and died the following spring in the hard frost of 1775-6. This specimen was in the Ashiton Leroy's museum, and the trunk with the armoury, ovari and oviduct, presented by Hunter, is preserved in the museum of the Royal College of Surgeons. In Hunter's account there is a note animating objections which will occur to most. It might be supposed, as is observed in the note, that this bird was really a cock which had been substituted for the hen, but the following facts put the point beyond doubt.

First, there was no other pied pea-fowl in the country, and the hens were perfectly like before the change. Secondly, the young ones appeared to be of the same size, and the young one is juicy and juicy. In the autumn the great feast was complete, even in this country, without this bird, which was presented by the outer well cooked, but in all as gorgeous plumage; and the adventurous knight made his solemn protest, of which the chorus was,
It is not quite clear what Sir R. Henan means by the 'jaapned breed' in the passage herebefore quoted; but ornithologists generally agree in considering the peacock last described as a distinct species. The figures of Aldrovandus were taken from drawings sent to the pope by the emperor of Japan. Shaw's figure (Nat. Hist.) was engraven on an Indian drawing. From the sketch of the head (Hist. Nat. de Gallinago) was derived from Vaillant, who took it from an individual living at the Cape of Good Hope, whither the bird had been sent from Melbourne. Bills and legs less stout. Head and neck with less of naked skin, being partial. The Iris dark brown. Length nearly four feet; expanse of wings more than five.

Female wild Turkey. — Irides similar to those of the male. Bill and legs less stout. Head and neck with less of naked skin, being partial. Iris dark grey feathers. Those on the back of the neck have brownish tips, and so produce a longitudinal band there. The short caruncle on the front is incapable of elongation; and though the tuft on the breast is present in young hens, it is highly developed in the older ones, as may be seen in Mr. Audubon's celebrated plate. Prevaling hue of plumage dusky grey, each feather having a metallic band duller than in the male, then a blackish band, and lastly a greyish fringe. The blackish band is almost continuous on the neck feathers and under surface. The whole plumage is more sombre than that of the male; there is less white on the primaries, and there are no bands on the secondaries. The colour of the tail is much as it is in the male. Length not exceeding three feet. Caruncle present.

Young wild Turkey. — The sexes are not easily distinguished till the skin of the head and neck begins to be tinged with red; but a tubercle on the breast of the young males at the approach of the first winter shows where the tuft is to be; during the summer, it is about two inches long; and during the third the bird is adult. It continues however to grow in dimensions and beauty for several years. The females attain their full size and colouring at the third year, though they have the breast tuft, which is not so full as it is in the male, and seldom exceeds the length of four or five inches.

The weight of these birds must either be now greatly diminished or the older writers must have been given to excessive exaggeration, which either with the time, or the changes in the climate, is likely. 30 lbs. has been mentioned, and a modern ornithologist of some celebrity, relying on old authorities, goes beyond the latter weight as the maximum, putting however the minimum at 20. The Prince of Musignano states that birds of 30 lbs. weight are not uncommon, and that he had ascertained the existence of some which weighed 40 lbs. Mr. Audubon gives the average at from 15 to 18 lbs., and mentions a single instance, in the market at Louisville, where the weight was 35 lbs.

Habitat. &c. — The Prince of Musignano (Continuation of Wilson's North American Ornithology) informs us that the males, usually termed Gobblers, associate in parties of from ten to a hundred, and seek their food apart from the females, and in autumn and winter, at certain times, very late in the day. The weight of the male, he says, is about that time about two-thirds grown, or form troops with other females and their families, sometimes to the amount of seventy or eighty. These all avoid the old males, who attack and destroy the young; whenever they can, by reiterated blows on the skull. But all parties travel in the same direction and on foot, unless the dog of the hunter or a river in their line of march compel them to take wing. When about to cross a river, they select the highest eminences, that their flight may be more sure, and in such cases they sometimes go, or more, as if in consultation. The males upon such occasions gobble obstreperously, strutting with extraordinary importance, as if to animate their companions; and the females and young crows fly away and assume much of the same manner. The male then gobbles as long as his tail as they move silently around. Having mounted at length to the tops of the highest trees, the assembled multitude, at the signal note of their leader, wing their way to the opposite shore. The old and fat birds, contrary to what might be expected, exceeding their tails for support, closing their wings, stretching out their neck, and striking out quickly and strongly with their feet. All do not succeed in such attempts, and the weaker often perish. The wild turkeys, according to the same interesting author, feed on seeds, all sorts of berries, fruits, grasses, and
ices; tadpoles, young frogs, and lizards are occasionally found in their crops. The pecan-nut is a favourite food, and so is the acorn, on which last they fatten rapidly. About the beginning of October, whilst the mast still hangs on the trees, they gather together in flocks, directing their course to the rich bottom lands, and are then seen in great numbers on the Ohio and Mississippi. This is the *turkey-month* of the Indians. When the turkeys have arrived at the land of abundance, they disperse in small promiscuous flocks of every sex and age, devouring all the mast as they advance. The flight of the autumn is apparently familiar after their journeys, and then venturing near plantations and farm-houses. They have been known on these occasions to enter stables and corn-cribs in search of food. Numbers of them are killed in time, and are preserved in frozen state for distant markets. The beginning of March is the pairing-time, for a short time previous to which the females separate from their mates, and shun them, though the latter pertinaciously follow them, gobbling loudly. The sexes, continues the Prince, "rost apart, but at no great distance, so that when the female utters a call, every male within hearing responds, rolling note after note in the most rapid succession; not as when spreading the tail and strutting near the hen, but in a voice resembling the clatter of pebbles when they wash in the sun, and is frequently repeated noise. Where the turkeys are numerous, the woods, from one end to the other, sometimes for hundreds of miles, resound with this remarkable voice of their warning, uttered responsively from their roosting places. This is not, however, the case on a morning of the sun, they silently descend from their perches, and the males begin to strut for the purpose of winning the admiration of their mates. If the call be given from the ground, the males fly to the spot, and whether they perceive her or not, erect and spread their tails, throw the head backwards, distend the comb and wattles, strut pompously, and rustle their wings and body-feathers, at the same moment ejecting a puff of air from the mouth, thus occupied, they occasionally halt, and look out for the female, and then resume their strutting and puffing, moving with as much rapidity as the nature of their gait will admit. During this ceremonious approach, the males cock at each other, and with desperate endeavor, when the conflict is terminated by the fight or death of the vanquished. The usual success of such victuaries are reaped by the conqueror, who is followed by one or more females, which roost near him, if not upon the same tree. With the spring they nest together, their habits are altered with the view of saving their eggs, which the male breaks if he can get at them. They are usually from nine to fifteen in number, sometimes twenty, withal and spotted with brown like those of the domestic bird. The nest consists of a platform of leaves placed upon a dry ridge, sometimes in the fallen top of a dead leafy tree, under a thicket of shumshch or briars, or by the side of a log.

Mr. Audubon gives a graphic picture of the parental care of the females on this interesting work. We must refer the reader for this and other accounts of the habits of these birds, and the enemies with which they have to cope. Bartram also has some curious anecdotes on this part of the subject.

This is the *Meleagris occidentalis* of Bartram; *Meleagris fera of Vieillot; Gallus d'India, Gallinago (sable, Gallina d'India (female), of the Italians; Coq d'Inde and Dindon, Dinde (female), of the French; Indische Hahn of the Germans; Wild Turkey and Domestic Turkey of the French, and American.

Geographical Distribution.—The range of the wild turkey extends from the north-western territory of the United States to the Isthmus of Darien; the birds which have been taken for it in the south of the Isthmus were probably Curassows [Cranix]. Roosts of its extension beyond the Rocky Mountains, or even so far, is not shown only by the absence of notice of it by the travelers in those parts, but from more positive evidence. The first account was given in 1766 by the Spaniards. Indians visited the city of Washington, not many years ago, they looked upon the turkey as a great curiosity, and prepared the skin of one to carry home for exhibition. The wild turkeys of Arkansas, Louisiana, Tennessee, and Alabama, and the unsettled parts of the states of Ohio, Kentucky, Indiana, and Illinois, form the great nursery of this species; but their domain is daily shrinking before the acquisitiveness of the settler; and many years will not elapse before the turkey will cease to exist as a wild species. It however still occurs, though probably in no great numbers, in the mountainous parts of the United States, for instance, in the Blue Ridge in Virginia. Fortunately it is that the race has been subserved to man in state of domestication.

Belen was one of the first who considered the bird to be the *Meleagris* of the antients; and this is somewhat extraordinary, because he appears to have been a good scholar, and the bulk of the passages in which the *Meleagris* is mentioned could not have been a turkey. Avdovandof, Gesner, and others followed in the wake of Belen. Linnaeus, though he retains the name Meleagris, well knew that the turkey was a native of the new world.

Pulill delectator Allio, Uricus; a fate et plumas cerevis. In well-regulated poultry-yards, eud, chopped corn (green), and boiled nettles are among the best kinds of food now in use for turkey chicks, whose very existence depends upon regular feeding and protection from rain. Barrington (1781) is the last writer of any note who supported the native hypothesis; for he tells the Indians: it is however but right to remark that, when he wrote, the existence of the large flocks in a wild state in North America was not generally known, though many of the older writers [Lawsen and others, for instance] mention them as a matter of common knowledge. Monnier overthrows that theory, upon which we shall no longer detain the reader, the question being now considered as settled.

The time of the first appearance of the turkey in Europe is more uncertain. The dispatch of the Jesuits to the Jesuits somewhat hastily, for there is evidence that turkeys were known in Europe about 1530, if not before that year; whereas it was not before 1534 that Ignatius Loyola, being at Paris, entered into a solemn compact with six of his companions, to found a religious society on the foundation of that religious order. [Justus.] The probability is that the Spaniards were the first to bring this bird to Europe, whence it has spread over the whole civilized world; but it is not impossible that it may have been brought to England by some of the early expeditions, and some of the small expeditions. In a domesticated state the plumage varies as much or more than it does in the common poultry. White is far from uncommon; buff is more rare. But the most curious variation that mentioned with these Strangers, which was Madame Backer's aviary at the Hague. This bird had a topknot sprigging from the crown of the head, and a crest of a pale reddish tint, with an ample crest of pure white, were reared by the same lady.

The history of this bird in some of the countries would afford ample shelter to these fine birds, and there, with little trouble, they might be kept in a state of nature. They would soon return to their wild habits, even if it should be thought too much trouble to import some of the true wild breed; and a male addition would make the game in such royal preserves as Windsor and the New Forest. Formerly many were kept in Richmond Park, and Windsor Forest was much frequented by them.

*Meleagris gallopavo.*—Cuvier first described this bird from the specimen formerly in Mr. Bullock's museum, and now in that of Paris, for which it was bought at the breaking up of Mr. Bullock's collection, and lost to the country.

The crew of a vessel were cutting wood in the Bay of Honduras, when they saw three individuals, and captured one alive, which was sent to Sir H. Halford, and met with an accident after its arrival in the Thames, and before it reached Sir Henry, which caused its death. Sir Har...
Mon turkey, having a caruncle at its base, apparently capable of elongation and contraction like that of the common sort. Head and two-thirds of the neck naked, and apparently, livid, but without fleshy tubercles on the lower part. There are five or six above each eye, fixed upon the centre of the crown, and six or seven in a line one above the other at nearly equal distances on the sides of the neck. No trace of a tuft on the breast could be perceived; but the plumage was rather damaged. Feathers round at the ends; those of the lower part of the neck, upper part of the back, scapulars, and all the lower part of the body, bronze-green, with two terminal bands, the first black, and the last, or that next to the tip, of a golden bronze hue. The tufts on the other parts of the back are the same, but near the tail-coverts they are more vivid, the bronze becoming of a rich blue or emerald green, according to the incidence of the light, whilst the outer band becomes broader and more golden. Red mingles with the tints on the rump, where the lower part of the crown is not the same. The blue band, surrounds it, and gives each feather an oscillated appearance. The tail-coverts and lower feathers of the rump are so disposed that there are four rows with these oscillated tips. The tail, consisting of fourteen feathers only, is greyish brown, deep black, minutely spotted and bordered with bronze, black, and green, but wanting the lustre of the upper parts. Quills and bastard wing black, edged obliquely with white, which occupies the external margin of the first almost entirely. Outer webs of the secondaries pure white, not showing the bands in the centre when the wings are closed; the uppermost blotted in the centre with black shot with green, which as the feathers shorten extends more over their surface, so as to leave only a white edge. Greater covert's chestnut. Feet and legs lake-red. (Cuvier; Temminck.)

Polyplectron (Temm.)

Genetic Character.—Bill moderate, slender, straight, compressed, the base covered with feathers, convex above, when it is thin, ovate and part of the beak naked; maxilis lateral, placed towards the middle of the bill, and half closed by a membrane. Two spurs on the feet; tarsi long and slender, the hind toe not touching the ground. Tail feathers long and rounded, the fifth and sixth longest.

This beautiful form was raised to the rank of a genus by M. Temminck, who established it upon the bird which was named *Pavo Thibetanus* by Brinson, *The Chinese Peacock Pheasant* by Edwards, *Pavo bicoloratus* by Linnæus, and *Pavo Thibetanus* by Kever. It is one of the Peacocks, properly so called, but other species have been since discovered, which, throwing further light upon the modifications of form, well justify its genuine separation. It is the *Dilectron* of Vieillot.

Examples:— *Polyplectron Emphanum*; *Polyplectron Chouqui; Polyplectron Chalcemum; Polyplectron Emphanum.*

Description.—Male: Length about 19 inches. Forehead and crown ornamented with a crest of long, narrow, loose feathers, which, together with the plumage of the neck and breast, are rich bluish black with metallic reflections. Above the eyes a large pure white shining stripe, and a patch of the same colour upon the ear-feathers. Back and rump brown, with irregular paler waved bands. Belly and breast deep black. Wing coverts and secondaries brilliant blue, each feather tipped with velvety black. Tail rather long, much rounded, brown, thickly spotted with ochraceous white, and distinguished by large oscillated oval spots of a brilliant metallic green. Towards the end of each feather there is a blackish bar. This beautiful and ample tail is supposed not to be erectile, but to be capable of very wide expansion. This is the *Eperonner à Toupé* at M. Temminck; the *Eperonner à Toupé* at M. Temminck; the *Eperonner à Toupé* at M. Temminck; the *Eperonner à Toupé* at M. Temminck.

Locality.—Sunda and the Molucca Isles probably.

*Polyplectron Emphanum* (male).

*Polyplectron Tibetatum*.

Description.—Male: Length about 22 inches. No crest, but the small greyish-brown plumes on the crown of the head are turned forwards, and appear as if ruffled. Head, neck, breast, and belly brown, with transverse waved bands of blackish brown. Throat whitish. Back, rump, and tail-coverts clear brown, spotted and waved transversely with greyish white. Outer webs of the secondaries pure white. Wings, generally, yellowish grey sprinkled with small blackish-brown bands, each feather having at its extremity a large round oscillated brilliant blue spot shot with purple and opaline hues. A circle of deep black, which is, in its turn, set in a ring of yellowish white, surrounds each of these iridescent spots. Tail-feathers dull brown, sprinkled with small ochraceous spots. Upon each of the twenty-two true tail-feathers, at about an inch and a half from the tip, well as as on those of what has been called the upper range at about an inch from the tip, two oval spots with purple and blue reflections with double circles of black and white like those of the wing, but hardly so brilliant, are separated by the shaft only.

Female.—Differing from the male in having the oscillated spots less brilliant, a shorter tail, and no spurs.

Young.—Plumage earthy grey, with large brown spots and bands. At the first moult the plumage becomes more irregular, the spaces upon the wings and tail where the spots are to appear become visible, but they are without lustre, and the pale circle is not present. At the third moult the plumage acquires its full brilliancy. (Temminck, &c.)

This is the *Pavo Tibetanus* of Brisson and Gmelin, the *Chiquis of Buffon, the Thibet Peacock* of Latham, the *Peacock Pheasant* of Edwards, and the *Eperonner Chinquis, Polyplectron Chinquis* of Temminck.

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Locality.—Supposed to be the mountain-chain which separates Hindustan from Tibet.

In the Polypectron Chalcourum the plumage is comparatively sombre. The ocellated spots on the wings and tail are absent, and the latter, instead of being rounded, has a more elongated pheasant-like form, approaching to that of Argus.

The beautiful birds above briefly noticed, and inhabiting the Indian Islands or China, are described as being almost as hard as the peacock, and there is little doubt that they might be domesticated in this country. The Thibetian Polypectron is procured for the aviaries of the wealthy Chinese, and M. Temminck's drawing was taken from a bird that had lived for five or six years in an aviary at the Hague.

Mr. Gray (Illustrations of Indian Zoology) has figured two other species, Polypectron Hardwickei, nearly allied to P. beccariam and P. lineatum, which appears to Sir W. Jardine to be the young of some other species; there are, he observes, no spurs on the tarsi. Mr. Gray's figures were taken from General Hardwicke's drawings by native artists.

Argus. (Temm.)

Generic Character.—Bill compressed, straight except at the extremity, where it is curved, vaulted, and naked at its base; nostrils placed in the middle of the upper mandible, half-closed; head, cheeks, and neck naked. Tarsi long, slender, spursless. Two middle tail-feathers longest, secondary quills much more developed than the primaries.

Example.—The only species known is Argus giganteus.

Description.—Adult Male: In bulk not exceeding an ordinary fowl, but measuring from the tip of the bill to the extremity of the two long tail-feathers five feet three inches, of which length these feathers form three feet eight inches. Throat, upper part of the neck, and cheeks naked or nearly so, there being only a few black hairs dispersed over them. Feathers of the head and back of the neck short and velvety. Lower part of the neck, breast, belly, and thighs reddish brown, each feather speckled with dull yellow and black. Upper part of the back and lores covered with large black spots, separated by a narrow ochraceous line; upper tail coverts clear ochraceous yellow, with brown spots; the longest paler, with spots thicker than at the back, and reddish brown in the centre. Tail deep chestnut sprinkled with white spots, which are encircled by a black ring. The wings, the secondaries of which are three times as long as the primary quills, are painted and ocellated in a manner that defies description. A very lost idea of the pattern of one of these secondaries may be derived from the accompanying cut.

Young Male.—Uniform dull brown, spotted and irregularly blotched with reddish yellow, brown, and black. No appearance of the ocellated spots after the first moult and before the second. The shafts of the wing-feathers are black, the quills dull brown, clouded with a line on the spot and on the outer edge black undulated bands, and brownish yellow ground, and the parts where the ocellated spots are to come are marked with black crescents surrounded with chestnut. After the second moult all the colours are more regularly distributed. After the third their definition is still more exact, but the showy spots are small, irregular in form, and less numerous than in fully-grown birds. After the fourth moult the colours achieve their beautiful and elegant harmony, and the markings and spots their full size and complete regularity.

Females.—Head and forepart of the neck naked; the tip of the head is covered with a thick short down, which stretches downwards upon the neck, where it becomes gradually longer, and assumes the form of feathers. These parts are brownish grey. Lower portion of the neck, breast, and upper parts of the back, chestnut-red; lower part of back, rump, lesser wing-coverts, and tail-coverts have numerous black bands on a yellowish-brown ground. Some of these bands are large, and others narrow and zigzagged. No long feathers in the tail, which folds together, forming an angle like that of a common hen, and is brownish chestnut variegated with spots and black bands. The secondaries, which in the male are two feet ten inches in length, are in the female only thirteen inches, narrow, and, with the ocellated spots much less conspicuous, blackish-brown, with small and irregular bars of ochraceous yellow.

This is the Beautiful Chinese Phasian described by Phil. Trans, vol. 55, p. 88; L'Argus ou Lac de Buffon. Argus Pheasant, Phasianus Argus of Latham: L'Argus giganteus of Temminck.

M. Temminck, from whom the above descriptions are taken, only obtained two females with thirty males. The most probably owing to the males being the great object of the hunters from their magnificent plumage.

Habits.—The unwieldy size of the secondaries forms an impediment to the bird in its progress through the air, but assist it pace when running, which it does swiftly and with agility. Its flight, when it does rise on the wing, is heavy and short. When the bird is at rest or unexcited, the beauty and grace of its plumage are not so apparent; but when at the same time the tail is comprehended...
Lophophorus. (Temm. Monaulus, Vieill.)

Generic Character.—Bill strong, long, very much curved, wide at its base, rather thick, convex above, the upper mandible longer than the lower, and overlapping it, large and trenchant at its extremity; nostrils half closed by a membrane covered with small scattered plumes. Tarsus furnished with a long and sharp spur; hind toe elevated and not touching the ground except at its end. Tail-feathers fourteen, straight and rounded. Fourth and fifth quills longest.

Example, Lophophorus Impeyanus.

Description.—Male: We must refer our readers to the bird itself, or to the excellent figure in Mr. Gould's Century of Birds from the Himalaya Mountains, for anything like an adequate idea of the beauty of its tints; for the greater proportion of the plumage is dazzling with changing hues of green, steel-blue, violet, and golden bronze. The bird looks as if it were principally clothed in a scale-armour of iridescent metal; but the plumage is soft and velvety to the touch. The crest on the head consists of naked-shafted feathers, with an oval or battledore tip of the same quality as the rest of the plumage, and of a metallic green. The centre of the back is pure white. The tail is rounded and bright chestnut. Size of a hen turkey.

Female.—Much smaller. Her plumage is altogether sombre, and without a trace of the splendour which shines forth in the male. The feathers of the head are a little lengthened behind, but not in any degree like the crest of the male. Fore-part of the neck pure white; rest of the plumage reddish-brown variegated and mottled with spots and bars, except a little white at the extremity of the tail-coverts and tips of the tail-feathers.

Young Male.—Much like the female.

Lophophorus Impeyanus, male and female, upper figure, male. (Gould.)

Habits, Food, &c.—The principal food of this species consists of bulbous roots, for scooping out which its bill is well adapted. Nothing certain seems to be known of the rest of its habits.

Locality.—The mountain-ranges of Nepal and Himalaya. This is the Lophophorus reflexens of Temminck; Impeyan Pheasant, Phasianus Impeyanus of Latham.

There is little doubt that this noble bird would bear the climate of Great Britain, or that it might be made a splendid addition to our game preserves.

Numida. (Linn.)

Generic Character.—Bill short, strong, vaulted, stout, furnished with a warty membrane at the base; from the lower mandible hang two carunculated wattles; head...
naked or feathered; forehead surmounted with a bony casque or feathered crest; nostrils pierced in the cere, and divided by a carillogue. Tail short. Fourth quill longest.

The birds known to the ancients under the name of Meleagrides* and Gallinae Numidicae belonged to this genus. They are all natives of Africa, living principally on berries, small slugs, &c. We select as examples Numidia Meleagris and Numidia cristata.

* Numidia Meleagris.—This, the Gallina di Numidia of the Italians, Poula de la Guinée and Peintade Meleagride of the French, Pintado de the Spanish, Perl Hühn of the Germans, and Pearl Hen, Guinea Hen, and common Guinea Fowl of the British, is too well known to need description.

The bird has been spread very widely, and few poultry yards are without it. In Jamaica, where they do much mischief to some of the crops, they have assumed their wild habits, and are shot like other game.

Numida cristata.—Description: Less than the common Guinea fowl. Head and neck bare, of a dull or leaden blue shading into red on the head, which is ornamented with a crest of loose hair-like feathers of a bluish-black, instead of the hard casque of the common species. This crest advances forward as far as the nostrils, but the feathers mostly turn backwards. General plumage bluish-black spotted with grey; there are from four to six spots on each feather. Quills pale yellowish brown; edges of the secondaryaries pure white, showing well in contrast with the rest of the dark colouring.

This is the Peintade à Crête and Peintade huppé of the French, and Crested Pintado of Laiham. It is the genus Guttera of Wagler.

Locality.—Africa, Great Namaqua country.

Mr. Swainson is of opinion that the Spotted-winged Pintado is a distinct species, which he names Numida maculipennis.

PAWN. [Pledge.]

PAWNBrokers. All persons who receive goods by way of pawn or pledge for the repayment of money lent thereon at a higher rate of interest than five per cent. per annum, are pawnbrokers. The character of the individual to whom the money is lent is scarcely a subject of consideration with the lender; he may be satisfied, if he believe that the thing pledged is not stolen or come by in an unlawful manner.

Pawning differs from other ways of lending and borrowing money in this: in pawning, the goods of the borrower are delivered to the lender as a security. [Pledge.] When the borrower is in arrears in the interest, the pawnbroker, he is often satisfied with a written engagement from the borrower, and if it should be required, with the additional engagement of some other person. When further security is required by the lender, it may be land, or shares in a stock, or it may be something which is not in itself capable of immediate tradition, as the future benefit to accrue from a policy of insurance; but all these kinds of security are different from that given in pawning, and are treated under the articles Mortgage and Snipe.

The prudent pawnbroker, like the prudent farmer, in many countries carried on under the immediate control of the government as a branch of the public administration; and where only private individuals engage in it, as in this country, it is placed under regulations. Thus in China, where pawnbrokers are very numerous, Mr. Davis (Chinese, vol. ii., p. 438), they are under strict regulations, and any one acting without a licence is liable to severe punishment. The usual period allowed for the redemption of the pawned goods is three years. The highest legal rate of interest on deposits is three per cent. per month; but in the winter months the money advanced on wearing apparel may not exceed two per cent., on the alleged ground that poor persons may be the more easily to redeem.

The 12 Anne, stat. 2, c. 16, fixes the legal rate of interest for one month at 3s. 4d., and under 20s. one per cent. per month. For every pledge upon which there shall have been lent any sum not exceeding 2s. 6d., the sum of 4s., for any time during which the said pledge shall remain in pawn not exceeding one calendar month, and 8s., or three-pence halfpenny, for one month afterwards, including the current month in which such pledge shall be redeemed, although such month shall not be expired. If there shall have been lent the sum of 2s. one penny; 7s. 6d., one penny halfpenny; 16s., two-pence; 30s., two-pence halfpenny; the halfpenny; 20s., four-pence; and so on progressively and in proportion for any sum not exceeding 4s. eight shillings; but if exceeding 4s. and not exceeding 4s. eight-pence; if exceeding 4s. eight-pence, and not exceeding 10s., the rate of three-pence for every 20s., by the calendar month, including the current month, and so on in proportion for any fractional sum. Parties may redeem goods within seven days after the expiration of the first calendar month without paying interest for the extra seven days: or within a week on paying the forthoom then charged, unless the original duplicate was lost, to the truth of which depend...
tation on oath must be made before a magistrate. For this second duplicate the pawnbroker is entitled to demand one halfpenny, if the sum advanced does not exceed 5s.; from 5s. to 10s., one penny; and afterwards in the same proportion as for the original duplicate.

The penalties against unlawfully pawnng goods the property of others is between 20s. and 5l., besides the full value of the goods pledged; and in default of payment, the offending party may be committed for three months' imprisonment and hard labour. Persons forging or counterfeiting duplicates, or offering to the first or second duplicate, are liable to imprisonment for any period not exceeding three months. Pawnbrokers or other persons buying or taking in pledge unfinished goods, linen, or apparel entrusted to others to wash or mend, are, to forfeit twice the sum advanced and to restore the goods.

The Act empowers police-officers to search pawnbrokers' houses or warehouses when suspected to contain unfinished goods unlawfully pledged, and goods unlawfully pawned may be detained by the police during the business in hand.

All pawned goods are deemed forfeited at the end of one year. If redeemed, the pawnbroker must endorse on his duplicate the charge for interest, and keep it in his possession for one year. Articles on which sums have been advanced must be sold by auction, after being exposed to public view and at least two days' notice having been given of the sale. The catalogue of sale must contain the name and abode of the pawnbroker, the month the goods were received, and their value without such parts as may be concealed. Pictures, prints, books, bronzes, statues, busts, carvings in ivory and marble, cameos, intaglios, musical, mathematical, and philosophical instruments, and china, must be sold separate from other goods, on the first Monday in January, April, July, and October part of the year, previous to the 7th of the month, or at such times as the owner may direct.

The penalty on pawnbrokers selling goods before the proper time, or injuring or losing them, and not making compensation to the owner, according to the award of a magistrate, is 50l. They are required to produce their books on the common seal of the county or country, and are not to purchase goods which are in their custody.

The Act extends to the executors of pawnbrokers.

The Act prohibits pledges being taken from persons intoxicated or under twelve years of age. (By the "Metropolitan Police Act, 1834" 47th of the Session, or 1834, 5th of William 4th, and an Act of the 16th of the Old Twopenny Post pay 15l. a-year for their licence, and in other parts of Great Britain 7l. 10s. 6d.

The licence expires on the 31st July, and a penalty of 50l. is incurred if it is not renewed ten days before. No licence is required in Ireland, but they must carry on the business of pawnbrokers must be registered.

From 1833 to the end of 1835, the number of pawnbrokers in the metropolitan district increased from 368 to 360; in the rest of England and Wales, from 1833 to 1194; and in Scotland, from 82 to 88, making a total of 1668 establishments, which pay 15,419l. for their licences, besides the licence which many of them take out as dealers in gold and silver. The increase in the number of pawnbrokers in the course of the above five years is nearly 5 per cent. In London, 10 per cent for other parts of England and Wales, and nearly 70 per cent. for Scotland. The increase in England is to a considerable extent chiefly in places where the business of a pawnbroker has not hitherto been carried on; and in Scotland, according to the 'New Statistical Account' now publishing, the extent of this innovation is quite remarkable. The business of a pawnbroker was not known in Glasgow until August, 1806, when an itinerant English pawnbroker commenced business in a single room, but decamped at the end of six months; and his place was not supplied until June, 1813, when the first regular house was established in the basement of a building for Scotland for receiving goods in pawn. Other individuals soon entered into the business; and the practice of pawnng had become so common, that, in 1820, in a season of distress, 20-43 houses of families pawned 7380 articles, on which they raised 739l. 5s. 6d. 34 of these families of 1375 had never applied for or received charity of any description; 474 received occasional aid from the Relief Committee; and 194 were paupers.

The capital invested in business in 1832 is stated to be one of the articles pledged are redeemed within the legal period. (Dr. C. Cleland's 'Former and Present State of Glasgow,' 1840.)

There are no means of ascertaining the exact number of pawnbrokers' establishments in the large towns of England, but it is estimated that there are 533 houses of pawnbrokers employed in those at Manchester was 107; at Liverpool, 91; Birmingham, 54; Bristol, 33; Sheffield, 31; but owing to the time which has elapsed since the census and the kind of information which it gives on this matter, we have been compelled to rely on the information that it was desirable to possess. A return of the amount and nature of the dealings of pawnbrokers would doubtless offer many valuable illustrations of the condition and habits of the people. The only return of the kind which we have been able to secure was published in Glasgow to Dr. C. Cleland, who read it at the meeting of the British Association for the Advancement of Science in 1836. The list comprised the following articles:—539 silver spoons, 35 chairs, 208 pairs of trowsers, 84 pairs of stockings, 1264 watches, 1541 silver spoons, 1235 silver bangle, 74 silver necklets, 245 silver rings, and 4800 silver necklaces. (Paper read in 1837, by Mr. Ashworth, of Bolton; 'On the Preston Strike in 1836.') The borough of Manchester stated on a recent occasion (April, 1840) that there were 112 pawnbrokers in the city, 102 of whom lived as masters, and 10 as subbrokers; 613 houses of pawnbrokers were in business, and 3639 articles were pawned, and 3497 were redeemed. (Petition 1131, Appendix to the 42nd Report on Poor Laws, Session 1839.) It is obvious from these returns that it stands out as the desire of obtaining some momentary gratification that the pawnbrokers make their large profits. It is stated in one of the Reports on the Poor Laws that a loan of 3d. is redeemed at the same day, pays annual interest at the rate of 6d. per cent; weekly.

\[
\begin{array}{l}
4d. & 3900 \\
6d. & 2600 \\
9d. & 1733 \\
12d. & 1366 \\
\end{array}
\]

In the petition already quoted, it is stated that on a capital of 3d. employed in (weekly loans) pawnbrokers make in twelve months 32. 2d.; on 5s. they gain 19. 4d.; on 10s. they clear 22s. 3d.; and on 20s., lent in weekly loans of sixpence, they more than double their capital in twenty-seven weeks; and should the goods being pawned be restored without damage, the owner shall receive 6d. per cent. of the value of the article so restored.
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pawned remain in their hands for the term of twelve months (which seldom occurs), they then derive from 20 to 100 per cent. The 'Loan Fund Societies,' which are protected by an Act of the Legislature, and advance small sums at 6%., at 1 per cent., are of advantage to the habitual dependents upon the pawnbroker.

The 'Pawnbrokers' Gazette' is a stamped weekly periodical containing advertisements of sales, and other information of use to the trade, amongst whom it exclusively circulates.

The act for the regulation of pawnbrokers in Ireland is the 25 George III., c. 43 (Irish statute). It requires pawnbrokers to take out licences and to give securities; appoints the Marshal of the city of Dublin corporation registrar of licences; provides that it is to be renewed on the monthly oaths, of sums lent; and allows the registrar a fee of one shilling on each return. The act requires the returns to be laid before parliament; but this is not done, and a petition was presented to the House of Commons, in 1857, complaining that the statute was evaded by an arrangement made by the registrar with the pawnbrokers not to require any returns from them, upon their paying him 1l. yearly. The act is also neglected in other respects, especially in the mode of selling unremedied pledges.

The rate of interest allowed is 25 per cent. per annum. Duplicates are charged one penny for sums under 10s.; from 10s. to 40s., twopenny; from 40s. to 10l., fourpence. It is the practice to charge interest for one whole year, in a great number of cases that a single pledged is redeemed in a week. The operation of this plan is shown in the following table:

<table>
<thead>
<tr>
<th>Per week</th>
<th>Per month</th>
<th>Per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>£ s. d.</td>
<td>£ s. d.</td>
<td>£ s. d.</td>
</tr>
<tr>
<td>0 0 0.14</td>
<td>0 0 0.6</td>
<td>0 0 6.6</td>
</tr>
</tbody>
</table>

One shilling per week, 1d. interest, and 1d. for the duplicate, is

One pound lent in shillings pays 4d. 6d. 4d. interest, and 4d. for duplicates, is

One hundred pounds lent in shillings pays 4 £ 10s. 6d. interest, and 8 £ 8s. 6d. for duplicates, is

Thus the sum of 100l. lent in shilling loans redeemed at the end of a week, at compound interest would amount in one year to 105l. 45s. 3d.

Mr. Barrington, the founder of the Mont de Pitié at Limerick, stated in a petition to parliament, in 1837, that there were 700 pawnbrokers in Ireland, whose incomes, averaging 800l. each, amounted in the aggregate to 560,000l. per annum. (Petition of Petitioners on Public Business, Session 1837-8.) The pawnbrokers of Ireland, in a counter-petition, asserted that the number of their body did not exceed 440, and that, with the exception of some of those resident in Dublin, Cork, Limerick, and Belfast, their average incomes did not exceed 400l. per annum. (Petition of Petitioners on Public Business, Session 1837-8.) The probable truth may be found between these contradictory statements. Mr. Barrington was engaged at the time in founding the Limerick Mont de Pitié, and means of providing funds for the public charity of that city. A capital of 400,000l. was raised in debentures bearing interest at 2 per cent.; and the Limerick establishment was opened on the 13th of March, 1837, under the control of a committee, consisting of the two city members, the mayor and chief police magistrates, and the Protestant and Roman Catholic bishops. In the course of the course of several months, about 70,000 pledges at a rate of interest amounting to one farthing per month for a shilling, no charge being made for duplicates. Six-sevenths of the amount advanced was in sums under 5s. Four months after the establishment was opened, the value of articles redeemed on Saturdays averaged about 14ol., the interest on which amounted to £ 3. 6s. 6d., while the pawnbroker's charge would have been 9l. Towards the close of the year 1839, Mr. Barrington published a short pamphlet showing the further progress of the institution. The capital had been increased to 12,500l. and a clear profit of 1734l. had been realised since March, 1837.

Small sums are lent to poor persons of known respectability for the character on their personal security. This plan is attended with valuable effects upon the conduct and character of the poorer classes. In Appendix E, "Poor Inquiry (Ireland)," there is an account of the Ahascragh Loan Society, which shows where individuals can be found to superintend the details of a ruinous plan of applying to pawnbrokers may be partly obviated. This society had borrowed 200l., partly from churches, and partly from individuals, which had then been repaid by 400 borrowers, and no loss had occurred during the two years in which the society had been in operation, chiefly from the sequence of the attention of the Rev. H. Hunt, the treasurer. In the case of a man taken at an annual interest, and a man of men called usurers are to be met with in every direct and who bind both borrowers and sureties by a mortgage on real estate. Such facts show the expediency of affording every encouragement to establishments conducted under the immediate control of the law. In some instances in Ireland pawnbrokers keep spirit-shops under the same roof or in the same building. The following table, showing the sums for which goods were redeemed for a poor woman at Hobart Town, is from the Astral-Asian Review of Nov. 12th, 1839:

<table>
<thead>
<tr>
<th>Articles</th>
<th>Amount</th>
<th>Interest per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town</td>
<td>£ s. d.</td>
<td>weeks' interest £ s. d.</td>
</tr>
</tbody>
</table>
| Cloak              | 4 0 0 | 3 6 0 1 4 | 1 1 4 3 | 8 0 6 1 9
| Kettle             | 2 6 10 | 2 3 1 3 | 1 3 1 4
| Jacket             | 2 0 8 | 2 3 5 | 1 2 4 3
| Gown               | 3 0 8 | 2 3 5 | 1 2 4 3

Principal 14 6 Interest 7 6

The duplicates all contained the following notice:—The duplicate must be renewed or the pledge redeemed within six months from the date hereof, or the article will be forfeited.

The Mont de Pitié is an institution of Italian origin, founded by the Duke of Montepeloso in France, in 1630, and consists of the following:

Mont de Pitié in England, and the following is the list of a pamphlet which was printed in London in 1847 in connection with the society, which however never issued a separate leaflet. Observations manifesting the convenience and commodity of the system of the Mont de Pitié for those in need of Relief from the Poor or Others in Distress.

"It is extremely doubtful whether a public institution for lending money on pledges would answer in London. Many similar institutions would be necessary, and it would scarcely be so economical a proceeding to conduct such institutions belonging to private individuals. To give an institution a monopoly resembling that which the public possesses, would never be thought of in this country. The rate of interest charged by pawnbrokers is high, while the average profits of their trade are not so great, and might be inferred from a hasty glance at the present tables, which nevertheless fully prove, that having recourse to pawnbrokers is an injudicious mode of raising money. In 1838 a company was formed in London called the British Pledge Society, which proposed lending money..."
Among the constitutions of Walter de Grey, archbishop of York, A.D. 1133, the pax was one of the regular ecclesiastical ornaments, or rather implements, ordered to be provided in every parish church.

It was usually in the form of a metallic plate or tablet, with a support at the back, and had a representation of the Christian Lamb, others in relief or engraved. The magnificat pax of silver, engraved in niello, by Fuggeruera, is still preserved at Florence.

The general use of this plate in modern times is attributed by Le Brun (Exposition Litteraire, &c. de la Marine, tom. i. p. 593) to certain jealousies which are found to arise among individuals, about priority in having it presented to them.

The use of the Pax was not among the ceremonies which were first abrogated at the Reformation in England: on the contrary, it was incorporated into the service of the Church of Edward VI., and rendered more ostensible than it had been, as appears by the following injunction, published in the deanery of Doncaster, in 1548:—'The clerke shall bring down the pace, and standing without the church-door, shall say and prays to the people, This is the token of joyful peace, which is between God and man's conscience.'

(De Cange, Gloss., v. 'Osculatorium,' 'Osculum Pacis,' 'Pax,' Milner, 'On the Use of the Pax,' Archæolog., vol. xx. p. 334; Burnett, 'A Catalogue of the Pax, and other Devices of State, in the year 1833; and the following brief analysis of them may be useful, if it be desired to estimate the extent of similar transactions in the private pawnbroking establishments in the United Kingdom. The absence of records makes it impossible to estimate the number of such goods as can be preserved to the amount of two-thirds of their estimated value; but on gold and silver, four-fifths of their value is advanced. The present rate of interest is 1 per cent. per month, or 12 per cent. per annum. The price paid for the pax, which is the sum of 35,391 l., was 650,000 l. in its possession, and the capital constantly outstanding may be estimated at about 500,000 l. The expense of management amounts to between 60 c. and 65 c. on each article, and the profits are wholly derived from loans of 5 francs and upward. The profits of the business within the year are sold, subject however, as in England, to a claim for restoration of the surplus, if made within three years.'

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PAX LA, a town in Bolivia, situated near 16° 50' S. lat. and 68° 30' W. long. It stands in a ravine probably more than 1000 feet below the table-land of the lake of Titicaca [Bolivia], on some hills which are scattered over the ravine, on the northern side of which rises the elevated peak of Illimani. The ravine and town are intersected by a river, the Chiquanapo, which, by way of the eastern chain of the Bolivian Andes, is one of the remotest sources of the Rio Madeira. The ravine is enclosed by high and steep mountains, and contains little level ground; but it is cultivated with great care wherever cultivated, and the produce is the most abundant in that part of Peru, and hence carried into the interior. The surrounding country produces no article of export except gold and bark, which are collected in considerable quantity on the eastern declivity of the eastern range of the Bolivian Andes. The vegetation is of the most luxuriant kind, and the soil remarkably fertile. (Temple's Travels in various parts of Peru; Pentland, in London Geog. Journ., vol. v.)

PEA. The garden pea (Pisum sativum) is a native of the south of Europe, but sufficiently hardy in a young state, and even to moderate winters, when it may be sown in the summer. It is very much improved for our winters when they are moderate, and when the plants have, as in gardens generally, a sheltered situation.

The pea, together with the bean and kidney bean, are enumerated as the legumes cultivated by the Romans; and these indeed comprise the principal species of leguminous plants in the kitchen-gardens of Britain at the present day. Among these the pea ranks first in importance and general usefulness. It had probably been introduced into this
country at an early period, for peas are mentioned by Lydgate, a poet of the time of Henry VI, as being hawked in London. It appears however that for at least a century afterwards, in Queen Elizabeth's time, they were either not very common, or the manner of obtaining them early was unknown, for Fuller states that in the last-mentioned reign peas were brought from Holland, and were accounted 'fit dietaries for ladies, they came so far and cost so dear.'

The varieties of the pea are numerous. The best account of them will be found in the 'Transactions of the Horticultural Society,' 2nd series, vol. i., where 43 varieties, comprising no fewer than 175 synonyms, are arranged and described.

The following is a selection of the more useful varieties:

For early sowing—Early Dwarf.

Early Frame.

Earl Charlton.

D'Aubergne, a particularly excellent sort.

For the principal summer crop—

Blue Prussian.

White Prussian.

Groom's Top Dwarf Blue.

Dwarf Green Marrow.

Knight's Dwarf Marrow.

For late sowing—Knight's Tall Marrow.

There are some varieties of peas destinable, or nearly so, of the internal toughening of the pea itself; these are called sugar peas, and their pods are eaten cooked in the manner of kidney beans. The best variety of this class is the Large

Cooked Sugar, which will likewise be found a very good sort for use in the ordinary way.

The soil for peas ought to be fresh and well stirred, but not too rich; for in the latter case a luxuriant growth is induced without fertility.

The times of sowing are, in November for the earliest, and at intervals of a month, three weeks, or a fortnight, as the season advances, till Midsummer, the produce from any that may be sown after this period is very uncertain; as is indeed the case with the November and earlier sowings previous to those of spring. The shelter afforded the young plants in winter by spruce branches or temporary sowings is of course beneficial. Various plans have been suggested for forwarding peas under glass, so as to transplant in the end of February or in March into the open ground. The best mode is to sow in small pots, and at the proper season to turn out the plants with the ball of earth and roots as entire as possible, to plunge them at short intervals in rows, and to shelter them by sticks of a branching nature and fan form.

The data which should be allotted for the intervals between the rows of peas may be three, four, five, or six feet according to the growth of the sort and richness of the soil.

The plants should not be allowed to grow too thick in the rows, otherwise they are drawn up slender, without a due proportion on the lower part of the stem, which, in a hot case, as well as the leaves depending on it, is apt to become weak and to mildew.

Agricultural Cultivation.—The common pea is a vegetable too well known to require description. It is cultivated in the garden and in the field, and there are several varieties of it. The plant is naturally a creeper, having numerous tendrils, by which it lays hold of stronger plants and supports itself. The pods contain one row of round seeds, which at first are soft and unripe, but as they grow hard, they are used for the table under the name of green peas. They afterwards harden and become farinaceous, and the stem dries up. In this state they are threshed and stored for use like corn, and are chiefly eaten by hogs. The straw is given to cattle and sheep elsewhere.

There are some varieties of peas the stems of which do not rise or creep, but remain short, and hence are called dwarf peas. These are preferred for early sowing in the garden, and also in the field, as they are cultivated in the fields to be gathered in a green state. Every gardener strives to raise early peas, and the first which are brought to the London market are sold for a very great price. As soon as they are more common, such quantities are sometimes raised in the field, that the price scarcely defrays the expense of gathering and bringing to market. When the market is not overstocked, this crop is very profitable, as it does not exhaust the land, and there is good time for a crop of cabbages or turnips after the peas in the same season. But the

usual purpose for which peas are cultivated in the regular course of husbandry, is to fatten hogs. A white sort, was readily split when subjected to the action of masticating teeth, set wide apart so as not to grind them, is used in considerable quantities for soups, and especially for sea-stores. There is also a blue sort which answers the same purpose. To hog peas is of a grey or dun colour.

Peas contain much farinaceous and saccharine matter, and are therefore highly nutritious; no other seed surpasses them in this quality, except the seed of the French bean (Phaseolus). But this is refused by most animals in a green state, owing to a certain toughness, which makes them adhere to the teeth; and, even when boiled, they are relished by them as food for hard-working men, peas are excellent as well boiled and mixed with some animal fat, or the Iowa in which bones have been leniently removed, and the gelatine. In some countries peas-meal is baked into hard cakes, with or without oatmeal or barley meal. The cakes are nutritious, but are of difficult digestion, even where custom and hard labour have inured the stomach to that use.

The soil best suited to the growth of peas is a light sandy loam of some depth, and in good heart: the preparation of it is by repeated deep ploughings and harrowing with harrows or other instruments. It is not necessary that the land should be manured with cow-dung, as it makes them throw out abundant stems at the expense of the produce in pods. They follow well barley in winter, and at no other time; and may be planted with the same land in which the latter have been grown, provided the produce of the one does not injure the land of the other. The pea is a great feeder of the earth, and in some cases has been found to add 3 to 4 bushels of wheat to the land, as the pea is sown between the rows of wheat or barley.

Many farmers consider peas as a very uncertain crop; but they are only so when the land is carelessly cultivated. They are, no doubt, often injured by want of moisture; the soil, or by an excess of it; but deep ploughing will prevent the former, and careful draining the latter. If peas are sown on land which is exhausted, or naturally too poor, no certain crop can be relied on. It sometimes happens that an excellent crop is obtained against all probability, considering the state and tillage of the land. The following are the most unfortunate conditions: the land being light and in this case it would appear as if great care in the preparation of the soil were unnecessary, but this is not so. At any rate, and no prudent farmer will trust to the chances of weather, none but an industrious man will succeed. Many diseases of the peas, the cause of great disappointment and loss, and it may be laid down as a general rule, that no good farmer will trust to accident, when by a little care and attention a certain expenditure he may almost ensure success.

Peas must not be repeated on the same land in less than 12 or 10 years, nor are they to be recommended on very clayey, on which beans are to be preferred. Wherever besotted the soil, they are a much better preparation for other crops than they are for themselves. The obnoxious character of peas is the hoarding, besides the application of an abundant consanguine, of which the wheat reaps the benefit as well as the peas.

Peas should be sown as early as the ground will admit, being worked, and in very mild weather in January. This is a good time for sowing peas, which are intended to be thered green, in a sheltered situation sloping towards the south-west. The hog peas may be sown in February or March; and if they are horse-hoed, and the earth is raised up on the row and the plants, they will come to the surface foret. When peas are drilled at 2 feet or more between the rows, it will not take above two bushels to drill an acre. The old method of sowing peas broadcast and ploughing them in is seldom practiced, and to sow them at 3 feet or more between the rows is in nowise recommended, the birds having much too great a share of the seed. We peas follow clover, the practice of dibbing them in the ground, which has been turned over with the plough, is much
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to be preferred. Wherever dibbling is generally practised, and there are sufficient bands to put the seed into the ground in a reasonable time, it should be preferred for every kind of crop that can admit of the hoe in the intervals.

When peas are sown later than usual, it is useful to steep the seeds for a few hours, in order that they may vegetate sooner. A week may often be gained in the coming up of the crop by this means.

The Everlasting Pea, which is so well known in our gardens, has been recommended to be cultivated in the fields for a few years in succession, without any other cultivation than hoeing out the weeds and stirring the soil around the plants. The seed should be sown in rows, and the plants thinned out by the hoe, so as to stand a foot or 15 inches apart; they would then have room to grow out, and would cover the ground completely. By transplanting year-old plants, a still greater crop might be obtained. It is at least worth a trial.

Peas should be drilled in rows at such a distance as to allow a good space 'round each plant. Too much thinning is good repeatedly until the stems are so long as to fall down and cover the intervals: a slight earthing of the rows with a plough has the effect of keeping the stems from the ground and allowing the air to circulate under them, by which means they are encouraged; for in wet seasons the stems are apt to lie on the wet ground and to rot. When the seed is ripe in the pods on the lower part of the stalks, the crop should be reap'd, or many of the pods will burst, and the seeds be lost. The reaping is performed by pulling the pods from the plant by hand, or by means of two reaping-hooks, which partly tear up the stems, and partly cut them off. They are then gathered into small loose heaps, and left to dry. After being turned over till they are quite dry, they are carried to the farmyard, where they are stored in large piles. The heat of ripening, and its effect upon the quality of the peas, are considered as forming part of the art of keeping the harvest in a good state, by which means the peas are to be kept in store for the winter. For this purpose, the peas are stored in large baskets, into which are placed the pods, and then the baskets are placed in the storehouse, or in the house, in the same manner as the wheat is kept. In this way the peas are kept in a good state, and are ready to be used when wanted.

The peach withstands our winters unhurt, if they are not unusually severe. It even succeeds in America exceedingly well as a standard, in latitudes where the winters are much more intense, the summers hotter, than with us. The peach is particularly well adapted for the northern deserts, as deciduous trees suffer less from severe frost in winter when their wood is perfectly matured by sufficiently warm summers, than when grown in climates where they cannot enjoy that degree of summer-heat which they are naturally adapted for, and which they require above 75°, as is the case at Rome, and still higher at New York, the melting varieties of the peach do not possess that rich succulence which they acquire against a south wall under the more moderate summer heats of the climates of London or Paris. On the contrary, in the light of the sun the peach succeeds as a standard in Italy, the south of France, and other continental countries of Europe. Having summers equally hot; but it may be observed that where the mean temperature of the summer months is above 70°, or that of the warmest month above 75°, as is the case at Rome, and still higher at New York, the melting varieties of the peach do not possess that rich succulence which they acquire against a south wall under the more moderate summer heats of the climates of London or Paris. On the contrary, in the light of the sun the peach succeeds as a standard in Italy, the south of France, and other continental countries of Europe.

The peach, which is a native of Persia, is generally considered to be more especially a native of Persia. It was known to the Romans, and brought to Italy, where it became distinguished by the name of Persica; and this name it still retains under various modifications in the different countries of Europe; thus, peach is evidently derived from persica or pêcher, the latter being formerly written persier by the French. But the peach was not introduced into Europe until the 12th century, and has been found growing wild in various parts of Turkey in Asia. Pallas describes it as existing in the more southern parts of the Caucasus. From the frequency of its occurrence in a wild state, and the perfection which it attains under limited space, it is evident that it has a considerable extent on both sides of the above limits; but the locality must be very peculiarly circumstanced in which it will acquire full perfection beyond the 45th parallel on the one hand; and, on the other, its deciduous nature, requiring a cool season of rest, unfit it for the continued high temperature of a tropical climate.

It is to be regretted that there are as yet no perfect registers of the temperature of places where the peach in its natural state attains the greatest perfection. Such would at once form the surest guide for the establishment of principles for the regulation of that artificial climate which the tree requires to ensure its fruiting in perfection in Britain, and for which purpose the aids of glass and fire-heat are provided.

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found too high, but gradually as the temperature increases.
Air should be always freely admitted through the day when the plants are not
Light is so essential, that unless peaches be trained near
green, the fruit will neither acquire due colour nor
flavour. Viscidities of dryness and moisture must be avoided.
The roots should be well supplied with water from the fruit being ripened off, because at a later period none can be applied without deteriorating the flavour.
The management of the peach-tree can only be cor-
rectly understood by those who are aware of the disposition of the
buds. The number of buds of the leaves and shoots of the current season are produced either singly, in
pairs, or in threes from the same node. In the course of the
summer, or early part of autumn, a bud is formed in the axil of every individual leaf, and these are termed single,
double, or triple eyed; or buds, according as one or more
are produced at each node. In the following season, these buds develop themselves either as flower-buds or young shoots, and
previously to pruning it is necessary to distinguish the one description from the other. The flower-buds are plump and roundish; the wood-buds are more oblong and pointed
and one of these is generally situated between flower-buds in the case of triple buds occurring at the same node. It is
therefore expedient in pruning to shorten a shoot to these two lengths, or to remove the flower-bud, but never to a fruit-bud only, for no shoot could be prolonged from it, nor would the fruit attain perfection, owing to the want of leaves in immediate connection with
its footstalk. In selecting buds for the purpose of propa-
gating, flower-buds only should be chosen.
The mode of bearing is solely on shoots of the preceding
summer's growth.
The peach is propagated exclusively by budding; rarely on
the peach stock, but frequently on the almond, esp-
cially in the warmest climates. In this country it is usu-
pagated almost entirely on the plum stock, which is not
only much harder, but also possesses the property of spreading its roots nearer the surface than either of the two
stocks above described; thereby subjecting the peach to
more congenial nourishment in consequence of the roots
being within the influence of the solar heat. Whereas the
peach stock tends to strike downwards strong tap-like roots beyond the depth of the stratum warmed by the summer-
heat; and although the latter trees grow vigorously for a
few years, or so long as the roots have not penetrated too
deep, yet they afterwards become sickly, their foliage be-
comes narrow, and acquires a yellowish colour, and the
trees ultimately perish. The muscat and white pear-plum and the almond stock are, however, the best; the plum
stock is generally budded; the latter is esteemed the best. The French prefer the St. Julien plum stock, which answers exceedingly well.
The peach succeeds in any rich fresh loamy soil, but the soil must be well fruit-bearing, not to be resist-
tive, and a very complete mode of drainage is absolutely neces-
sary. It would also be desirable that the roots should not allow to penetrate deeper than two feet from the
surface. No objections could be made against the roots following their natural tendency downwards to whatever
distance they might go, if their extremeties were at the same
time in a medium congenial to the peach as regards tem-
perature; but this cannot be the case in Britain, unless
perhaps some chalk subsoil may form exceptions. It is
known by experience, that when the roots are in a medium of
much lower temperature than the mean of that of the
atmosphere during the growing period, the trees do not
thrive, nor does the fruit, under such circumstances, ac-
quitted its most striking characteristics, and no appli-
cation will effectually cure it without disfiguring the
appearance of the foliage. The best remedy for mildew is to take
up the tree carefully in autumn, renew the soil, and replant
the tree, spreading the roots near the surface. When peach
trees are laid close together generally grow luxuriously; and
if dung be abundantly incorporated with the soil, disease is
almost certain to manifest itself by the exudation of gum.
It is therefore advisable to defer the application of manure
until the trees begin to bear fruit, and then to apply it only as a salt as necessary to maintain the
over-luxuriant state of growth, and to retain the new roots
near the warm surface of the soil.
Various modes of training the peach have been adopted,
with different degrees of success. That of course has proved
the best which admits of the most equal distribution of sap
throughout the respective branches, and likewise the pro-
duction of a sufficient number of well-shaped shoots which have once borne fruit. The shoots being only useful for such purpose in the season immediately
following that in which they are produced. The fan
method, and a modification of it called Seymour's tra-
jectory method, is now in common use, and is based on the
principles of reducing the fruit-bearing shoot. A common error in the fan method is that of disposing a few
of the first produced branches so as to represent equi-
distant radii; the consequences of such disposition are
an excessive degree of vigour in the central and most up-
starting growth, which will tend to make the fruit become comparatively weak, linger for a few years, and
then die off. Their share of the sap is soon appropriated
by the more vertical branches, some of which will assume the character of stems, and prove unsuitable for producing
fruit-bearing shoots. Cutting these beard branches may
be only alternative in order to obtain other shoots for the pur-
pose of furnishing the lower part of the wall. By the
misdirection of the energies of the trees, several year's
growth is wasted, and when it is removed, new shoots
spring out such large branches, the tree receives a shock which renders it incapable of bearing such fine fruit as a very skillful management will ensure. It may be briefly affirmed that all methods of training are bad which admit upward
shoots. The trees will grow more vigorously when grown with a vigour ten times greater, in many instances
than the latter, owing to the strong vertical tendency of
the sap. Although the ascendency gained by a vertical
shoot over a horizontal one is considerable in the early
season, it is at the same time more liable to be
removed. That which would be gained in successive seasons, were the vertical portion allowed to proceed without interference from the
pruning-knife. If however a central vertical shoot be annually trained, and uniformly cut at the winter pruning
to within a third of the length of the previous year's growth, then result to the side branches, the vertical tendency against them being thus limited to a single summer shoot. This principle is the basis of the following mode of training.
In the first season, the trees should be trained for producing side branches, and a third for an upright
must be left. The first production of side branches, which are intended to produce the lower radii of the fan, must be trained at some elevation in the first instance, and after-
wards brought to a horizontal position; they should not be subdivided. Those however obtained in the follow-
ning season may be allowed to form two each, if sufficiently
vigorous, at some distance from their base, and as their
divergence affords room. The branches produced after these should be allowed to grow into a single shoot, which
should be divided into two, or even three. By this method of training the lower branches become strong, and acquire a well es-
brablished communication with the roots before the upper are
in existence, so that there is little danger of their dying of
usual diseases when horizontal and vertical branches are started at the same time.
By repeating the process here detailed, all the principal
branches are ultimately produced, to the number of between
thirty and forty, and disposed in a fan-like form, diverging
not exactly from a common centre, but from a short flat.
These branches support the shoots on which, during the
second season of their existence, the fruit is borne. Bush
for the origin of these shoots should be selected at the ex-
sistence of every twelve or fourteen inches along the upper
side of the branches, that being the side from which they
are obtained with the greatest facility, owing to the upward
tendency of the sap. As these shoots are being prolonged during the summer, they should be trained so that their
growth may be directed without injury to the foliage of
one shoot ought not to overtake that of others, yet the naked branches are benefited by the shad-
of leaves, for old bark exposed to the direct rays of the
sun is apt to split.
place of those that are bearing fruit. The fruit-bearing shoots being useless for such purpose a second time, must therefore be removed. The second pruning, when the young shoot, retained during the summer, is shortened like its predecessor, and trained for the purpose of bearing fruit and producing a successor, which likewise becomes subject to the same routine training.

The preceding directions are to be followed in order to the essential pruning, the development and maintenance of the form of the tree; but as a great number of superfluous shoots will be produced, the mode of their removal requires to be noticed. In the case of trees undergoing winter pruning, when the young shoots can be laid bold of, but should be completed in a gradual manner. A portion of such front-shoots as have fruit at their bases are first removed, then part of those elsewhere situated, making exceptions of the lowest on each bearing shoot, for succession, and of the terminal one. By degrees all are removed excepting the last two mentioned and those from nodes where fruit is set and promises to attain perfection. Finally, the terminal ones and those left on account of having fruit at their bases are shortened, or stopped, to about three inches in length, or so as to have several leaves for the purpose of maintaining the flow of sap and elaborating it for the nourishment of the fruit. Should these or the terminal shoots again push, such secondary shoots must be pinched off above the second leaf from the top.

Thinning the fruit is generally done much too sparingly. The vigour of the tree should of course be taken into consideration. As a general rule, one fruit on each bearing shoot, or on two at most, are all that ought to be left. By leaving too many, the size of the fruit is diminished, so that the aggregate weight of flesh is probably but little if at all increased, whilst that of stones, to the great weakening of the tree, becomes materially so. Some remove the flower-buds to a considerable extent, a practice which is very proper. It is advisable however to preserve several on each shoot, in order that a choice may be made of one or two of those like to take the lead.

The surface of the border should be frequently stirred; and when the weather is dry, watering will be necessary both for the border and foliage; but the use of cold spring water must be avoided. The ravages of the green fly (Aphis perennis) must be carefully guarded against. The best known remedy is to dust the tree, after spraying with sulfur, or powdered tobacco leaves. Coping-boxes, made to project about a foot, are of great utility in protecting the blossoms; but after the danger of frost is over, the coping ought to be removed.

The different varieties of peaches in cultivation at the present day in this country appear to have been obtained from France. Although designated by various English names, most of the sorts have been traced to be synonymous with the French peaches.

The different varieties admit of the following classification:

I. Leaves serrated, glandless.
   a. Flowers large (Clingstone) § 1.
   b. Flowers small (Mellots) § 2.

II. Leaves creased or serrated, with glandular glands.
   a. Flowers large (Clingstone) § 3.
   b. Flowers small (Mellots) § 4.

III. Leaves creased or serrated, with reiiform glands.
   a. Flowers large (Clingstone) § 5.
   b. Flowers small (Mellots) § 6.

Six more sections might be formed by admitting subdivisions of middle-sized flowers; but no varieties worthy of cultivation, and indeed very few of any description, being referrible to such sections, they have been consequently omitted.

The following list contains the best varieties of peaches, arranged according to the sections to which they respectively belong in the above classification.

Section 2. Early Anne, Noblesse, Malta.
Section 4. Royal George, Royal Charlotte.
cutting back a central shoot to about a foot, and training branches horizontally, right and left, the vigour of the tree is equally distributed. It often happens that in this mode the branches only produce fruit towards their extremities. When this is the case, a shoot should be encouraged near the middle of the branch, during this season, at an interval, and at some distance, say three feet; farther along the branches another may be laid in a similar manner, and so on, care being taken that each is stopped when its elongation can no longer be traced to its origin. The shoots will generally become as fruitful, after two or three years, as the portion of wood of the same age near the extremities of the branches themselves.

Training against espaliers was formerly more practised than it is at present, on account of the difficulty of hanging the old varieties of pears to bear, apart from a wall, together with the expense of erecting the espalier, and the liability of its materials to decay, have no doubt tended to bring this mode into disuse. It is however worthy of remark, that a greater extent of foliage can be exposed to direct light by espalier training than by any other on an equal extent of ground. New varieties will do away with the objection of unproductive ness; and although the cost of metalic substances is not likely to increase, the growth of brickwork, or of the espalier might be constructed of cast-iron, which would prove an ultimate saving; the small intermediate wood-work that would be requisite could easily be replaced.

In the cultivation of pears as standards, the head is always treated in the same manner; but it is subject to some modifications, and to be subjected to certain regulations, by pruning, as are necessary to preserve the equality of the principal branches with regard both to strength and distance; and likewise to render the whole sufficiently thin, in order that the sun's rays may be freely admitted.

In some situations, many kinds of pears remain long unfruitful; the best means of rendering them otherwise is of course a most important desideratum. So long as circumstances are very favourable for the propagation of wood, branch budding are not likely to be produced; the production of the latter results from a more or less insipid state of the juices; and will not take place whilst a copious flow of sap is continued. This may be interrupted by ligatures, ringing, grafting, or other analogous means. But these means frequently afford only a temporary remedy, and a repetition of the process is at the expense of the energies of the tree, so that it is rendered too weak for further bearing. There is still a more important object which the above means are not calculated to affect. If the roots are in a cold subsoil or out of the reach of solar influence, the fruit will only acquire an inferior degree of flavour. If however the tree be carefully removed for doing which autumn is the best season, so dug, or otherwise prepared, and the roots deprived of such roots as cannot be brought to a horizontal position, namely, that in which all the others should be placed when replanted, and if this be done as shallow as possible the re-echt will be occasioned, fruitfulness induced, and flavour communicated.

The management of dwarf standards is similar to that required for tall standards, excepting that the head is formed at the height of one or two feet from the ground, instead of six, the usual height allowed for the stems of standard trees in orchards, or where under-cropping is carried on, as in market-gardens, where the dwarf-headed trees would obstruct the growth of vegetables for a considerable time during their summer state. However they have some important advantages; a large head is sooner formed, and the fruit is not so liable to be blown down.

The French modes of training en Quenouille or en Pyramide cannot be strictly adopted in this country with advantage, owing to the richness of the soil and moisture of the climate, circumstances which are favourable to the production of shoots rather than fruit-tubs, and this tendency is further encouraged by shortening the shoots to the extent which is usual in this country. In both these modes tiers of branches proceed from a central stem, and the pyramidal form the branches are horizontal, each tier being successively shorter than the one below. In the Quenouille the branches are carried downwards, and this mode might be suitable in this country, but when the shoots at full length, care being taken that all upright shoots are shortened in summer.

The pruning of standard pear-trees is usually confined to the water regulation of the branches by thinning, and shortening where the subdivision of branches is desirable, or where they are too weak. Wall and espalier trees require both a summer and winter pruning. In summer a number of shoots will be produced beyond that which will be required for training. If these are allowed to grow without check, the branches will become large in the interval of the season, and then at once cleared away, the tree is apt to receive a shock from which it does not soon recover. If the shoots are shortened too much or too early, the buds, which will grow in vigorous manner in the following spring, will immediately become excited (other chances for the flow of sap being cut off), and burst into shoots [MORPHOLOGY].

In order to avoid this, w hich is a case of frequent occurrence, some of these superfluous shoots should be first stopped at an early period, and afterwards another portion of the middle of June part of them may be cut back to within two or three inches of their base; and thus by degrees the whole will be ultimately reduced, without any great or sudden derangement of the general flow of the sap. The winter pruning is attended with less vital danger to the tree. It consists chiefly in shortening spurs to the lowest fruit-tubs and judiciously thinning them.

The trees are generally being in a less or another less occasion for raising the trees after they have been once planted. Still, after four or five years, it will, under all circumstances, prove advantageous to remove the trees from the wall, trench the border, and replant, spreading the roots some distance in the soil, the shoots being only cut downwards. Cutting the roots, without entirely removing the tree, is attended with the disadvantages arising from partial loosening of the soil, and the difficulty of reaching the perpendicular portions of the root. A list of the best varieties of pears will be found enumerated in the article Poire.

PEARCE, ZACHARY, born 1690, died 1774, an eminent divine and scholar, and a prelate of the English church, who went through his studies at Cambridge, and afterwards became Dean of Hereford, and held several bishoprics and abbeys in various parts of the kingdom; he was a great scholar, and held in high veneration by all who knew him. He was a man of integrity and probity, and his writings are full of instruction and edification. He was a man of great learning, and his writings are full of instruction and edification. He was a man of integrity and probity, and his writings are full of instruction and edification. He was a man of integrity and probity, and his writings are full of instruction and edification.
It remains to be added that he numbered among his friends some of the most eminent men of the age, and that he was highly esteemed and venerated throughout his long life.

PEARL. [SHELL]

PEARL FISHERY. The fisheries which are carried on to supply the market of the world with pearls are numerous, but among the most important is that of the Persian Gulf, the fishery at Catifa in Arabia, which produced the pearl bought by Tavernier for 110,000 lacs, was celebrated in Phénix's time.

In the Old World, the west coast of Ceylon, that of Coromandel, and the Persian Gulf, are among the most prominent stations. The Algerine coast and the Sooloo Islands furnish a certain share.

In the New World, the neighbourhood of St. Margarita, or Pearl Island, and other localities on the coast of Columbia, furnish a great many, and the Bay of Panama also contributes considerably; but the pearls which we have seen from the Western world, though many of them are large, cannot be compared with those of the East in shape, colour, and general beauty.

Of the latter fisheries, those at Ceylon and Tutucuren (coast of Coromandel) are monopolies; the first belonging to the government, and the second to the East India Company; but, by outwitting the government, becomes of much value, for the reason that the fishery is let seldom covers the expenses of management, guarding, &c.

The Bahrein Islands (Persian Gulf) give a most abundant harvest of these beautiful molluscous secretions; perhaps chiefly because the warehouses, or the tomans of Bassorah, about 90,000 l., sterling of our money, and often more, are derived from the fishery in about two months, the time during which it lasts, the commencement being in June. Here there is no monopoly; but any one may engage in the trade upon payment of a tax on the produce to the government. The Persians principally are engaged in it, and the divers are of that nation.

The Western pearl fisheries, especially those on the coast of the Persian Gulf, are the most celebrated of the whole. The alone is said to have imported upwards of 697 lbs. in the year 1594. The second Philip's celebrated pearl, which weighed 300 carats, and was valued at 150,000 l., came from Margarita. These prizes were not forgotten in 1625, when joint-stock companies raged. One company under- took the prosecution of the Colombo fishery, and another embarked in that of Panama and the Pacific, both with about the same success; for in 1625 they were abandoned. Some fine specimens of the shells of Mollusces were sent home from these expeditions, and remain on exhibition in the British Museum. We believe, undertaken by an English company in 1826.

The pearls which are the objects of these fisheries are found in the shells of Molluscs, or pearl-oysters, as they are termed, or in the shells of the oyster. The latter is the species known as Anicula or Mollusca marginata. The best ground is considered to range at depths varying from 6 to 8 fathoms; and the divers, who usually are unhealthy and short-lived, are said to be able to remain generally from a minute to a minute and a half under water. Two minutes, four, and even six, have been mentioned; but constructed as the human respiratory and circulating system is, we should think the last-mentioned periods must be very rare. A submer- sion of a minute and a half is calculated to do mischief enough in ordinary cases. The following account of one of these fisheries is from Percival's Ceylon:—

"There is perhaps no spectacle," says the author, "which the island of Ceylon affords more striking to a European than the bay of Condachte during the season of the pearl fishery. The desert bay at the spot is at that time converted into a scene which excels, in novelty and variety, almost everything I ever witnessed; several thousands of people of different colours, nations, tongues, castes, and occupations crowd thither; the buildings are numerous, and the numbers of small tents and huts erected on the shore, with the bazar or market-place before each, the multitude of boats returning in the afternoon from the pearl banks, some of them laden with riches; the anxious expecting countenance of the native merchants, while the boats are passing through the shore, and the eagerness and avidity with which they run to them when arrived, in hopes of a rich cargo; the vast numbers of jewellers, brokers, merchants, of all colours and all descriptions, both natives and foreigners, who are occupied in some way or other with the pearl, some se-
bottom, with a hole perforated through the smaller end sufficient to admit a rope. Some of the divers use a stone shaped like a half-moon, which they fasten round the belly when they mean to descend, and thus keep their feet from sliding down the sides of the vessel. These people are accustomed to dive from very high a place, and fearlessly descend to the bottom in from four to ten fathoms of water in search of the oysters. The diver, when he is about to plunge, seats the rope to which one of the stones is attached, and fastens it tightly to his right foot, while he takes hold of a bag of net-work with both of his left hand, it being customary among all the Indians to use their toes in working or holding as well as their fingers; and such is the power of habit, that they can pick up a stone weighing from three to five pounds, almost as nimbly as a European could with his fingers. The diver thus prepared seizes another rope with his right hand, and holding his nostrils shut with the left, plunges into the water, and by the assistance of the stone speedily reaches the bottom. He then hangs the net round his neck, and with much dexterity and all possible dispatch collects as many oysters as he can while he is able to remain under water, which is usually about two minutes. He then resumes his former position, makes a sign, and by this means draws up the right-hand rope, which, immediately by this means drawn up and brought into the boat, leaving the stone to be pulled up afterwards by the rope attached to it.

The serious effects which so protracted a submission must produce upon the human frame are manifested by a discharge of water from their mouths, ears, nostrils, and, frequently, of blood. But this does not hinder them from going down again in their turn. 'They will often,' contains from his latest three or four plunges from day to day, and at each plunge bring up about a hundred oysters. Some rub their bodies over with oil, and stuff their ears and noses to prevent the water from entering, while others use no precautions whatever. Although the usual time of working is four or five minutes, yet there are instances known of divers who could remain four and even five minutes, which was the case with a Caffre boy the last year I visited the fishery. The longest instance ever known was that of a diver who came from Anjouan in 1797, and who absolutely remained under water five minutes."

The last-mentioned period seems almost incredible, but there is no reason to doubt Captain Percival's evidence. The chief horror and danger awaiting the diver are considerable in the ground-shark. This animal is a common and fearful inhabitant of all the seas in these latitudes; and its terrors are so continually before the eyes of the divers, that they seek a vague safety in supernatural means. Before they begin diving, the prayers of the conjurors, who are known in the Malagasy language by the name of Pallar Karror, or binders of sharks, are always consulted, and whatever the conjurer says to them is received with the most implicit confidence. The preparation which he enjoins them consists of certain ceremonies according to the caste and sect to which they belong, and on the exact performance of these they lay the greatest stress; nor will they on any account descend till the conjurer has performed his ceremonies. His advice are religiously observed, and generally have a tendency to preserve the health of the devotee. The diver is usually enjoined to abstain from eating before he goes to plunge, and to bathe himself in fresh water immediately after his return from the labours of the day. During the time of the fishery the conjurer is present till the morning of the first day, noon, maturing prayers, distorting their bodies into various strange attitudes, and performing ceremonies. All this time they ought to abstain from food or drink; but they sometimes indulge themselves with toddy, till they are no longer able to divest themselves.

Some of the conjurers frequently go in the boats with the divers, who are greatly delighted at the idea of having their protectors along with them, and become additionally venturing. The seal of the conjurer who goes in the boats appears to be stimulated by the hope of a valuable pearl. As a body, these keepers of the concourses of the sharks reap a rich harvest: for, besides being paid by the government, they get money and presents of all sorts from the black merchants and those successful in fishing up the oysters.

The address of these fellows," adds Captain Percival, in redemoning their credit when any untoward accident happens to falsify their predictions, deserves to be noticed. Since the island came into our possession, a diver at the fishery one year lost his leg, upon which the head conjurer called in account for the loss. He gave as the most striking picture of the knowledge and capacity of the people he had to deal with. He gravely told them that an old witch who owed him a grudge had just come from Colang, on the Malabar coast, and effectuated a conjurer conjuration. The diver, it was said, had gone down to Colang; but in returning, to get his leg, he was stopped by a man who went a proportion of the oysters caught, which they take the chance of opening on their own account: the latter is the method most commonly adopted. The agreements with the people who hire out the boats are conducted much in the same way. They contract a certain sum for the use of their boats, or pay the chief farmer of the banks a certain sum for permission to fish on their own account. Some of those who pursue the latter plan are very successful and become rich, while others are great losers by the same service. Some are so accommodated that they are always exhibited, for oyster lotteries are carried on to a great extent, and they consist of purchasing a quantity of the oysters unopened, and running the chances of either finding or not finding pearls in them. These lotteries are great amusements, and in some places are considered as a necessary amusement. The. The greatest difficulty is to find a diver who will consent to work, as the work is considered as disagreeable. The boat-owners and merchants lose some of the best pearls while the boats are on their return to the bay from the banks, as the oysters, when alive and left for some time undisturbed, frequently open their shells of their own accord, and thus the pearls are easily prevented, by means of a bit of grass or soft wood, from aqua closing its shell till an opportunity offers of picking out the pearl. "Those fellows who are employed to search out the pearls, are easily opened without any danger of injuring the pearls, which might not be the case if they were opened fresh, as, at that time, to do so requires great force. On the shell being opened, the oyster remaining unharmed, for the ear; it is usual to boil the oyster after the pearl is out, the flesh of the shell, is not unprofitably contained in the body of the fish itself.

The stench occasioned by the oysters being left to putrefy is intolerable, and remains long after while the fishery is over. It corrupts the atmosphere. The town of Condathey, and renders the neighbourhood of that country extremely unpleasant till the monsoons and violent south-west winds set in and purify the air. The returns show that none is not however so large as to amount to more than four months after the fishing season, numbers of people are to be seen earnestly searching and poring over the sand in places where the oysters had been laid to putrefy; and these are now and then fortunate enough to find a pearl, with the great discomfiture of their friends.

In 1797, while Mr. Andrews was collector, a Cooil, or near
A specimen from Spain, gave, by Dr. Thomson's analysis——

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<tr>
<td>Silica</td>
<td>70-490</td>
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<td>Alumina</td>
<td>11-600</td>
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<td>Peroxide of iron</td>
<td>4-384</td>
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<td>Lime</td>
<td>2-900</td>
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<td>Potash</td>
<td>6-200</td>
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<td>Water</td>
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PEARLS AND MOTHER-OF-PEARL consist, according to Mr. Hatchett, of carbonate of lime and albumine.

PEARSON, JOHN, born 1613, died 1666, a prelate of the church of England, and the author of "An Exposition of the Creed," a work which, having been greatly used up to the present time as a kind of text-book in the examination of candidates in divinity, has been reprinted a few times, and been several times reprinted. He was a native of the village of Snoring, educated at Eton, from whence he went to Cambridge, and took holy orders in 1639, on the eve of the civil wars. Lord Herbert appointed him his chaplain, and presented him to the living of Torrington in Suffolk. But the chief scene of his labours as a parochial minister was in London, where he had the living of Saint Clement Eastcheap, and it was to the inhabitants of that obscure parish, and of the lecturers who delivered the sermons afterwards forming his celebrated Exposition, and to them that work, when first published, was dedicated. The first edition was in 1658, and in the same year he published the works of Hales of Eton, giving to them the title of "Golden Remains of a Living Man." In 1666 John Hales had died a short time before in penury and distress, having been deprived of his means of subsistence by the fanaticism of people who for a time obtained the ascendency in the English church.

On the Restoration a proper regard was had for Pearson's eminent merits as a rational divine and diligent preacher. He was created doctor of divinity by the king's mandamus, made a prebendary of Ely, archdeacon of Surrey, and finally, a Bishop of Chester. He died July 14, 1668.

PEARL-ASH. [Potassium.] PEARL-HEN. [Pavonida.] PEARL-OYSTER. [Avicula; Malleacea.] PEARL-ROCK. [MISSISSIPPI, State of.] PEARL-SPEAR. [Snellimanthis; mara. It is also crystallized.

The primary form is an oblong rhombo-, the angle of which is but little different from that of the magnesia carbonate of lime; but the curvature of the planes prevents the cleavage. It is easily affected parallel to the faces of the primary form. Has a perfect tenacity. Can be scratched with a compress of lime readily.

Colour white, greyish or yellowish, or brownish. Lustre pearly in general. Translucent. Opalescent. Specific gravity 2.83. Dissolves slowly in nitric acid. The fragments heated by the blow-pipe are attracted by the magnet.

It occurs abundantly in the lead-mines of the north of England, in those of Derbyshire, and is also Devonshire and Cornwall. It occurs also in many parts of Europe and America. Analyzed by Hinsinger he yielded:

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<tr>
<td>Carbonate of lime</td>
<td>45-60</td>
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<td>Lime</td>
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<tr>
<td>Magnesia</td>
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<td>Oxide of iron</td>
<td>3-40</td>
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<tr>
<td>Oxide of manganese</td>
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PEARL-BONE occurs massive in great beds in clay, parphyritic, and secondary narrow rocks. The structure is granular: it consists of roundish masses which vary in size, and which are sometimes from one to two inches in diameter; these are formed of thin concentric laminae. The surface is rough and pitted. It is hard and very opaque. Opaque. Untranslucent on the edge. Very easily frangible. Fracture uneven. Colour usually grey, but sometimes bluish or reddish-brown. Hardness 5 to 6. Specific gravity 2.342. Found at Tokay in Hungary, and in Spain.
Philosophy" to which they relate. On the other side, Dr. Pearson was among the first to sound an alarm respecting the danger to which the church was exposed by the spread in it of Calvinistic views of the Christian doctrine. On this subject he published various tracts at the beginning of the present century, copies of which were expressly directed against Mr. Simpson, who was the great maintainer of Calvinism in the university to which Dr. Pearson belonged. In fact, he stood forth the champion of the Armenian clergy in the church, and the champion at the same time of the church in whatever seemed to threaten its integrity and its perpetuity.

It seems unnecessary to give the titles of a long list of writings in divinity; but it may be useful to say that a complete list, arranged chronologically, may be seen in the "Gentleman's Magazine" for 1811, where it is also said of him that he was a good man, of gentle and benevolent manners, kind and charitable, easy and pleasant in conversation, modest, unassuming, much respected, and beloved. He died on August 17, 1811.

PEAT is a substance of vegetable origin, found wherever the soil has been long soaked with water which has no outlet and does not completely evaporate by the heat of the sun. When dried peat is examined, it is found to consist of roots and fibres in every stage of decomposition, from the natural wood to the completely black vegetable mould. From the nature of its formation under the surface of water, it acquires a portion of tannin, which has the property of preventing insect and vegetable matter from decay or decay. Hence large branches and trunks of trees are found imbedded in peat, which have no mark of decomposition, except what may have taken place before the wood was completely immersed in the peat. Peat contains all the vegetable and the richest of the vegetable manures, and may be in a manner converted into humus: for this purpose the agency of alkalis is the most effectual. If the tannin be decomposed, that of the vegetable fibres will go on, and soil may be formed. The peat is now dug up, if caustic lime be added to it before it is dry, the moisture of the peat slakes the lime, which acts on the gallic acid in the peat and neutralizes it. If this mixture be then excited to fermentation by the addition of animal matter, such as urine or dung, oxygen is absorbed and carbonic acid evolved; and the residue is converted into an excellent manure, containing much soluble humus. The same may be effected more slowly by mixing peat with clay or marl, and allowing the mixture to remain exposed to the atmosphere until it is considerably turned. But nothing accelerates this process like the addition of putrescent animal manure, which acts as a ferment and greatly hastens the decomposition.

The best peat forms the best manure are the chalky and clayey. Sand has little tenacity; it lets the gases produced by the decomposition escape, instead of attracting them, as clay and chalk do, and preventing their escape. The burning of peat destroys the vegetable matter and leaves the earths and salts behind. They are accordingly very strong stimulants to vegetation, especially that of clovers and herbaceous plants, of which the leaves and stems are the most valuable parts. If the soil is well furnished with vegetable matter, and capable of bringing an abundance of seed to perfection, it may be very useful to apply stimulating manures, such as peat ashes, to increase the verdure; but on poor soils destitute of humus, the increase of the shoots and leaves does not ensure a proportionate increase in seed. Hence it is often remarked that good land will not bear ash, saltitre, and similar substances produce a deceitful growth, giving a rank green leaf, which is not succeeded by a heavy ear; but, on the contrary, the produce in seed is rather diminished than increased by the use of the manures. Whenever a stimulating manure is used, the soil should be naturally rich, or enriching manure should be applied at the same time. It is of no use to whip a horse which has had no corn and is half starved; and land which is exhausted cannot be made productive by applying saline substances, which in a richer soil abounding in humus would have excited the most vigorous vegetation.

The following particulars of the conversion of peat into a rich compost were given by Lord Meadowbank about forty years ago, and show that the principles which we have here laid down were known to him. He recommends taking the peat out of the mosses sometime before it is used, that it may lose a portion of its moisture, and be lighter to carry. It is then to be carted a dry spot, where the compost heap is to be formed. A bed of peat is to be laid six inches deep and fifteen feet wide: this is then to be put ten inches of good yard-dung, then eight inches more peat, and over this four inches of dung, and alternately to the height of four or five feet. The top should then be enclosed all round with a wall of peat. The whole is then covered with the same material. The proportion of horse-dung is very variable, according to the weather is mild; but more dung is required if the weather is cold: over this heap ashes or lime may now be spread in the proportion of a cart-load to twenty-eight of the compost. The dung should not have fermented much before it is spread, and if it is watered before or after, the effect will be more rapid. Animal manure, such as refuse of slaughter-houses, and every substance which readily undergo the putrefactive fermentation, will accelerate the process, and save dung in the room. Or, if pigeons' dung can be procured, a much smaller quantity will produce the desired effect. The heap should also be pressed down, but left to settle by its own weight. The heat produced by the fermentation is very great, and a heap six or eight feet high will keep up the heat till the whole is reduced to a small mass of black mould. It may then be put on the land, the same quantity that farm-yard dung would have been, and consequently, by a little labour, four times the quantity of peat would have been bought. If the peat is put on the land in a different form, such as in peat moss, it will not at all beneficial, but may even be injurious. A complete chemical change has taken place and the peat, from being very inflammable, is now so incapable of combustion, that only in a very great degree of heat will it burn. If the peat be laid in a manure, it is better for it to be put into a rich manure. In summer the whole process may be completed in eight or ten weeks; in winter a longer time; and it may be useful to give the heap a occasional dressing of fresh dung, as is done with hogs' manure, to open the surface and allow the heat...

Where a great extent of peat-moss renders the improvement of it desirable there are various ways in which it may be reclaimed. In some places the peat has been removed, and the loam which lay below it has been brought up. In other cases the peat has been laid over the banks of rivers, into which the peat was floated by means of small canals dug through it, and communicating with the river. In all other cases the mode adopted has been that of reclaiming and consolidating. In draining a peat moor the water must not be let off suddenly, for the surface may become so loose and dry, that no vegetation can take place in it. If the water is drained off to leave two feet of peat dry above its level, this will be a great improvement, as is shown by the experiments which have been made in the recent, Dr. Jenner's experiments being not the least of the recent improvements. The most rapid, is produced by bringing sand and sufficient quantity to cover the surface with two or three inches of it. This will make a beginning of a soil, as soon as potatoes may be planted. At first the surface will bear the wheels of a cart; nor the tread of a horse; but in a short time a solid crust will be formed, which will grow in strength and thickness as cultivation advances. There are many fine pastures in Scotland which once were peat-mosses, on which it would have been dangerous to walk, but are now capable of supporting a herd of cattle, as solid as any pasture on a clay subsoil. Manuring and liming are the most effective operations in bringing about this great improvement. Potatoes and oats are usually the first crops to be planted on reclaimed peat-mosses. It is long before they become capable of bearing where peat-mossing is recommended at any time, unless there be a good deep soil formed over the peat. Laying down grass as soon as a certain degree of improvement has been made, and casting it when the weather is at its busiest, is not so good in the future, as more than any other means to consolidate the surface and deepen the mould, which gradually increases by the decomposition of the tannin in the peat.

A patent has been lately obtained by Mr. W. L. Williams, for compressing peat into clods, or clods by means of a company, for compressing peat into dense masses, as to be...
As coal is said to be superior to coal in its properties of producing heat by combustion, forming an excellent charcoal or coke. It is asserted that this charcoal is much more combustible than that of wood, and very useful in the manufacture of fire-works. Mr. Williams has found that with 10 cwts. of pit coal and 28 cwts. of its factitious coal, the same amount of steam can be generated as with 174 cwts. of pit coal alone.

The process is as follows:—Immediately after being dug it is triturated under revolving edge-wheels faced with iron plates perforated all over the surface, and is forced by the pressure through the electric blow-pipes. It becomes succus of pap, which is freed from the greater part of its moisture by a hydraulic press. It is then dried, and converted into coke in the same manner as is done with pit coal. The factitious coal of Mr. Williams is made by incomparably superior means to that of the char, as much of the peat-charcoal ground to powder as will form a tough doughy mass, which is then moulded into bricks.

(Dr. Ure's Dictionary of Arts and Manufactures.)

The use of peat for fuel is too well known to require notice here. It is found in Holland, where it cannot be dug out of the solid mass, but is brought up in the form of mud from a considerable depth under water. It is raised by means of small strong men, each by an iron ring to a long pole, in which they work as a screw. This liquid peat is brought in boats to a place prepared for its manufacture, which has been levelled as a brick-yard usually is. The soft mud is spread over this to the depth of six inches, and when it remains beside with half an inch of water begins to dry, men fix boards to their feet and walk over it, so as to compress it; and as soon as it will bear cutting, it is cut with a spade made on purpose into oblong pieces of the usual size of peat, which is about eight or nine inches long and five wide; the rest and drying have reduced the thickness to about four or five inches. When completely solid, these peats are set on edge, and afterwards stacked loosely, so that the air may pass through them. In some places they have sheels, for the purpose of protecting the peat from rain. "Brought up sometimes more like wood or coal than the peat which is cut immediately from a solid moss. They give a very great heat, and form a coal which, when it is shut up in a close vessel to stop the combustion, and allowed to cool, has a considerable resemblance to coke. The ashes of this peat contain very little earth, and are very light and white. They are abundantly used as a top-dressing for grass and clover on light lands, and for this purpose are extensively exported to the sandy districts in Guelderland and Flanders. They are also used for all admiralty fires in the British Navy, and as fuel for all the purposes of manufactures, except for the forging of iron, for which coals are imported from England and the Netherlands. The peat-fens in Holland begin to be exhausted, and the fuel is so dear, that it is found more economical to send coals from England, which are used chiefly in east iron stoves.

PECCARY. [SUIDE.] PECCCHIO, GIUSEPPE, born at Milan in 1873, studied in the college of Somaschi under the well-known Father Soave, but afterwards proceeded to Padua to study the law. After taking his degree in that university, he returned to Milan, and in 1880 was appointed a-sistant counsellor of state for the departments of finances and the interior of the kingdom of Italy. In 1884 he lost his situation, in consequence of the administration of Lombardy, a circumstance which gave occasion to his work entitled "Saggio Storico sulla Amministrazione Finanziaria dell' ex-Regno d'Italia dal 1802 al 1814," which is a useful book of reference for the history and statistics of that kingdom. In 1885 he was elected a Member of the Congregations of the city of Milan. In 1897, being seriously implicated in the attempt at an insurrection against the Austrian government, he was obliged to emigrate. He first went to Switzerland, and from that country to Spain, where he remained many months until the outbreak of a constitutional government. Pecchio had thus an opportunity of observing the national character and the spirit of the various political parties. His observations on Spain are in the shape of letters, and published under the following title: "Sei Mesi in Spagna nel 1821." In 1822 he proceeded to Portugal, where the same passions and parties were at work, and he likewise recorded the impressions he received in that country in another

series of letters. "Lettere a lady G. O. dal Portogallo." Like his predecessors Barretti, Ailleri, Byron, and others, he was struck with the inferiority of the Portuguese as a people to their Spanish neighbours. Returning to Spain, he visited the southern provinces of that kingdom, and was at Carls at the fall of the constitutional government in the summer of 1823. He then returned to Carls, where he met several Italian friends and brother emigrants. In 1825 he was appointed, together with Count Gamba, by the Philhellenic Committee to convey to Greece the sum of 60,000 fr. the fruits of a loan made for the Greeks. Having executed his commission at Nauplia, Pecchio visited Smyrna, from whence he embarked for England. In his short stay in the Levant, Pecchio found time to make and record his observations, as he had done in Spain and Portugal. That was a critical period for the Greek cause, as the Egyptians were under Ibrahim Pasha, who commenced operations in the Morea. Pecchio's account of the affairs of Greece was published in English, with that of other contemporary travellers: "A Picture of Greece in 1825," as exhibited in the Narratives of James Emerson, Joseph Pecchio, and W. H. Hunn, R.A., engraved by himself, and published after his return home, in 1826. On his return home from the Levant, he published Pecchio's account of the affairs of Greece was published in English, with that of other contemporary travellers: "A Picture of Greece in 1825," as exhibited in the Narratives of James Emerson, Joseph Pecchio, and W. H. Hunn, R.A., engraved by himself, and published after his return home, in 1826. Pecchio, towards the end of 1825, Pecchio repaired to Nottingham, where he gave lessons in the modern languages, and he afterwards removed to an academy at York in the same capacity. Towards the end of 1826 he married an English lady of property, and went to Italy, where he remained for eight years in Brighton, where he wrote several works, in which he embodied his remarks upon England and the English. These remarks are expressed in a spirit of fairness and discrimination rarely found in the accounts of Italy by foreign writers.

Pecchio was an observer, and he was also happy-tempered and lively, a pleasant companion, and a man of the world. He came to England with prejudices against the country, but he took pains to study it, and became strongly attached to it. "Brought up in a family of priests," as he said of himself, "dazzled by the splendour of his triumphal car and the trophies of his half hundred victories, seduced by the benefits which he had imparted to my own country, I harboured in my heart for many years a feeling of hostility to England, before I had an opportunity of knowing and studying the country." (L'anno mille ottocento venti del Inghilterra, the last paragraph.) And he observes, in the same work, that the Italian writers of the last century, Faretlli, Algarotti, Genovesi, Filangeri, Ailleri, and others, have never had their country so accurately described as they were by English对应的内容。
PECORA, the name given by Linnaeus to his fifth order of MAMMALIA, and thus defined by him in the Systema Naturae.---

Lower incisors (dentes primores) numerous; no upper incisors. 

PECORA, the name given by Linnaeus to his fifth order of MAMMALIA, and thus defined by him in the Systema Naturae.
red oxalic acid, &c. Most of the stronger or mineral acids also decompose the saline compounds of pectic acid; but this is not the case with the greater number of the vegetable acids.

According to Dr. Thomson, pectic acid is composed of—

<table>
<thead>
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<th>Equivalent</th>
<th>143</th>
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</table>

| Eleven equivalents of carbon | 66 |
| Seven equivalents of hydrogen | 7 |
| Ten equivalents of oxygen | 80 |

PECTINA/RIA. Lamarck's name for a genus of Amphitritidae. Cuvier's fourth family of his Annelides Tubicolo, the first order of his Annelides. The Amphitritidae of Lamarck form the third family of his division of Sedentary Annelids, the others being the Dorsalidae, the Mallanidae, and the Segmentalidae. Amphi tritidae are characterized by the genera Pectinaria, Sabellaria, Terebella, and Amphi tritum.

Generic Character. Body tubicolar, subcelioidal, ateneduated posteriorly, having on each side a row of setiform or needle-like appendages: the filaments short and fascicled, covered with a papilla-like, golden spangle or peltate which are very brilliant and transverse. Mouth elongated, bilabiate, surrounded with short and numerous tentacles. Four pectinated branchiae, situated externally on the second and third segments. The branchiae are the most important and characteristic feature of the Monomorium.

Cuvier states that their intestine, which is very ample and folded upon itself many times, is ordinarily filled with sand.

Locality. The sea coasts of temperate and warm climates.

Example, Pectinaria Belgica. Seas of Europe. Lamarck's Pectinaria are the Amphitritidae of Savigny, the Chrysomela of Oken, and the Cy nenae of Leach, according to Cuvier, who, however, confuses the Amphitritidae with the Monomorium. They are characterized by the four pectinated branchiae, the absence of labial tentacles, and the transverse rows of spangles, which are the characteristic features of the Monomorium.

‘Where constant action is not necessary,’ remarks John Hunter, in his treatise On the Blood, ‘muscles alone are employed, as in the greater number of moving parts in most animals; and where any position is required to be constant, and the motion to be constant, from the adherence of the parts there elasticity is alone employed for the purpose of constant position, and muscles for the occasional action. Some bivalves (as the oyster) have a strong muscle passing between the shells for closing them occasionedally; but for opening them there is an elastic ligament formed by an elastic ligament of the joint of the two shells, which is squeezed, when shut, by the contraction of the muscle; and when the muscle ceases to contract, the elasticity of the ligament expands it, so that the shell is opened without an extraordinary violence.’

By this simple but beautiful contrivance the open state of the shell, which is necessary for the collection of food and the purposes of respiration, &c., becomes to the animal a condition of repose.

In the museum of the Royal College of Surgeons in London (Physiological Series) this adaptation is well seen. No. 63 is the longitudinal section of the valves of an oyster, to show the adductor muscle and its antagonistic the elastic ligament at the hinge, as above described by Hunter (Cut. v. 1. 1772).

The following explication is recorded by Sir Anthony Carlisle. In a pair of fresh oyster-shells, weighing 3468 grains, the entire elastic ligament or spring of the hinge weighed three grains and a half; the elastic power of this spring was equal to the resistance of a heavy weight of 3 pounds, and would have sufficed aoriduplus when placed upon the centre of the flat valve, and confined to the area of the insertion of the muscular valve. (Hunterian Oration, 1826.)

No. 623 (of the series in the museum above quoted) exhibit, the soft parts of a Scallop (Pecten maximus, Linn.) injected. The right mantle-lobe is reflected to expose the branchiae, which are seen protected by the mantle on the opposite side. The ciliary membranes are very delicate and supported by numerous close-set horny filaments, along which the branchial vessels pass. The branchiae are placed near the circumference of the shell, and currents of seawater are perpetually driven over and through them by the ciliary vibrations, added by the motion of the mantle. The large foot of this species is placed between the branchiae, which are four in number, two on each side. A thick bristle is inserted at the mouth, and a smaller one at the opposite side of the digested particles, and but with the right mantle-lobe wholly removed, to show the branchiae of that side and their supporting membrane. This is broadest at the posterior end and...
of the branchiom, and terminates in a point anteriorly, where the branchiom are lost between the two labial mem-

branes. (Cat.)

Mr. Garnier considers the foot of Pecten, &c., to be an organ for the prehension of the food collected by the vibra-
tile currents near the mouth. It has but one slender muscle. The same author observes that it is evident that in the

Pecten the labial ganglia are compound; and he states that the excretory organs throw off mucus and cuticular VES.

fcerea as compactate of inves, which latter is of ven found in them in the form of concretions; also une acid.

In the Pecten a minute orifice leads directly on each side into them. The oviducts likewise enter them. Above,

each excretory sac leads into a single transverse cavity with a very narrow aperture. The orifice of each is generally near the posterior muscle, and the oviduct more anterior. The ova are discharged into the excretory organs.

In the Oyster the vessels do not seem to form a gland, but throw off from their extremities distributed to the mantle the second volume of 'Transact. of the Zoological Society of London' (p. xvi). Fig. 1 shows the animal of the Pecten opercularis, the left valve removed, and the mantle turned up. All the parts are most clearly indicated by the letters of reference, and the eye-specks noticed in the article. The posterior intestine, liver, ovary, &c., of Pecten maximus are exhibited in fig. 2. Fig. 3 is one of the ovi, or eye-specks, found on the margin of the mantle of the same, with its optic nerve magnified; and in fig. 4 all the blood-vessels of Pecten maximus are shown. The large veins, situated upon the muscle, into which the veins, which are truncated in the figure, enter, are beautifully dis laid.

The organism of the oyster is altogether lower than that of the Pecten. In the former we see the well-developed foot, nor is there any structure of the ctenidium. The shells are the original organs of defence, and the ctenidium is but a defence of the animal when the shell is open. The ctenidium and the hinge of the shell, the chief bulk of the body is situated; it occupies the great concavity of the under valve, presenting a squared margin opposite to the hinge, and a projecting margin along its two sides, the surfaces of the body, which are placed without the shelf, and for the most part a lace-work of fat, when the animal is in good health, looking as if the omentum in quadrupeds. The muscular,

borders, projecting alike from the upper and under surfaces of the body, are gradually extended as they advance towards the hind part of the body. In some cases it becomes necessary to define a right and a left side. If an oyster be placed with its concave shell downward, and having the hinge next to the observer, the right and left sides will then be determined. The loose folds of the pa-

llum become one branchial cavity, nearly opposed to the muscular ligament, and they form an entrance to the interior of the branchiop, which may be called the branchiop, or branchiop. When the shells are expanded, the cavity of the branchiop becomes more dilated, and the muscles which form a rim of fifteen or more vessels, while the outer surfaces of those gills are filled with fresh supplies of water at each opening and closing of the shells. This simple and effective mechanism of these water-bellows is like the other all-wise provisions of Com-

punction.

At the upper squared end of the body, the marginal borders appear to be glabrous, and these, together with a middle follicle, seem to form the elastic ligament, or spring of the hinge. The two angles of this end of the oyster are slightly attached to the upper margin of the shell, by the upper and under surfaces of these angular extre-

mities; but those adhesions are not muscular, they are merely close contacts, and only occasionally used to scale the glandular parts towards the ligament of the hinge. At the upper end of the body, and on its left side, the marginal borders are more extended than upon the opposite or right side, and the top of this border forms a fold over the mouth, where two pairs of leaf-like lips are placed, so as to the under and under surfaces of these angular ex-

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a peculiarity not easy to be explained. The arterial and venous systems resemble those of the whole tribe of molluscosous Aephalia; but the singularities of each species are difficult to be traced, because the vessels are too delicate to admit gross injections, and those of more refined composition are apt to pass out of the vascular tubes, and by extravasation form a bundle of fasciculi. These tendons form a face-work by lateral junctions with each other, until the whole are collected into two principal cords, which are converged together, and finally inserted into the left side of the central muscular ligament. This bundle of tendons is capable of evulsing each of the human fingers, but their subdivisions in the oyster consist of several series, and those which are joined to the muscles are exceedingly multiplied. From observing the living oyster, it is evident that these radiated muscles are excited to contract, when touched, and that each stimulated part hauls up a tuck of the border of the pallium, and by a continuity with adjacent tendons, every touched point moves and excites similar neighbouring and allied muscles, so as to withdraw a larger portion of the pallium from annoyance. The use of all these arrangements appears to be for the protection of the living animal, since the irritable muscular borders of the pallium are not only adapted to withdraw themselves from hurtful impressions, but by pulling off against the central muscles, it becomes likewise excited, and immediately closes the valves.

Along the borders of each fold of the pallium, and projecting from both edges of their margins, are two rows of papillae, which are sometimes to be seen distended with fluid. When thus distended, they are composed of annular rings, like substance. In the distended state, these papillae, or nipples, often eject water from a pore at the point of each, and then collapse. The mesenteric portions of the pallium are fixed to the central muscle and tendon; they each consist of two plates of the general structure of the human intestine, and they embrace the tendons of the radiated muscular muscles. Between these membranous plates there are non-adhering spaces, like those between the aica and dura mater of the human brain, and from being occasionally found distended with water, they have been falsely called "absorbing vessels." These spaces appear to be truly cellular, and not continuous tubes, for they communicate with each other laterally, and thus resemble the cellular walls of the corpus spongiosum penis, just before they are converted into veins. The use of the cellular structure of these mesenteric membranes is, to protract the margins of the pallium by the force and direction of injected water; for when the mesentery of the pallium is so extended, the fronds of the borders are pushed to the margins of the shells. This action in the external mouth is performed by the syphon of the Pholas Dactylus. A dingy green colouring matter appears irregularly dispersed through the larger convex ranges of the fimbria, and it appears to be the same which colours the tingeing of the upper or flat shell. Papilae especially similar to those of the oyster may be seen in the syphons of Pholades, in the fresh-water mussel, in Actinida, and in several other molluscs. The outer surfaces of the pallium are occasionally found adhering at uncertain places, to the inside of the shells; but this cohesion depends wholly upon close contact, and it only happens where the shell is undergoing repair, or where it is augmenting; in no instance does the substance of the pallium mingle with the shelly materials.

**Pectens.**

Pecten. (Lamarck.)

Animal subround, not thick; lobes of the mantle very delicate, disunited throughout, thickened on the borders, and furnished with many rows of fleshy cilia, between which are regularly disposed a series of smooth osicular tubules; branchiae large, decomposed into detached filaments; small foot dilator of the extremity; mouth rather large, oval, surrounded with projecting organs but little furnished on each side with a pair of triangular palps, truncated at their extremity. (Deshayes.)

**Generic Character.**—Shell free, regular, inequiva, acuminate; lower valve serrate at the extremity of the hinge. Hinge toothless; cardinal process entirely internal, trigonal, and receiving the ligament. (Linn.)

**Geographical Distribution.**—The Pectens are widely diffused, and species are to be found in the seas of most passing from the margin and radiating towards the great central muscle.

' The muscular parts of these radiated muscles,' continues Sir Anthony, 'extend a few lines within those of the longitudinal bands; they are obviously retractors, or opposers to the marginal protrusions of the pallium,—and the line of the tendons is attached to the central muscular ligament. These tendons form a face-work by lateral junctions with each other, until the whole are collected into two principal cords, which are converged together, and finally inserted into the left side of the central muscular ligament. This bundle of tendons is capable of evulsing each of the human fingers, but their subdivisions in the oyster consist of several series, and those which are joined to the muscles are exceedingly multiplied. From observing the living oyster, it is evident that these radiated muscles are excited to contract, when touched, and that each stimulated part hauls up a tuck of the border of the pallium, and by a continuity with adjacent tendons, every touched point moves and excites similar neighbouring and allied muscles, so as to withdraw a larger portion of the pallium from annoyance. The use of all these arrangements appears to be for the protection of the living animal, since the irritable muscular borders of the pallium are not only adapted to withdraw themselves from hurtful impressions, but by pulling off against the central muscles, it becomes likewise excited, and immediately closes the valves.

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climates. Though there is a general similitude in the shells of all the numerous species which at once shows to what genus the animal belongs, the varieties of form and colour are infinite, and the species are in many instances very difficult to be defined, though the eye of an acute observer will at once determine differences which the pen cannot convey without some difficulty, if it succeed in making the differences understood at all. The colours of some are most vivid and beautifully variegated, whilst those of others again are sombre. The shells of some are stout and heavy, of others light, and some are nearly as transparent as glass (Pecten vitreus, Gray,*) and Pecten vitreus, King, for example. The depths at which they have been hitherto found range from the surface to twenty fathoms. Pecten vitreus (King), which occurred everywhere in the Strait of Magalhaens, was found attached to the leaves of Fucus giganteus, and formed, with other mollusks, the food of the camera or reserve of a branch of the Ithvea teres and Chionea lamarckii. The bottoms haunted by the Pectens have been found to be sand, sandy mud, and mud.

Utility to Man.—As an article of food the genus is generally useful. On our own southern coasts, where the sea is productive of its contributions to the table, Pectens are considered a delicacy, and when well treated by a good cook make a rich and sapid dish, as might be expected from the name of them when so prepared, "Quinns." The St. James's Cockle Shell, Pecten Jacobinus, was formerly the badge of the pilgrim who had been to the Holy Land.

Limnaeus separated this extensive genus, that is, the Pectens properly so called, into three sections:—1. The auriculated equilateral Pectens. 2. The Pectens with one auricle cut into spines within. 3. (Including Lima) Pectens with their valves more gibbous on one side than on the other. Of the first of these, Pecten Jacobinus and Pecten Pleurorectes are examples; of the second, Pecten Pulchrum, the well known Ducal Mantle of collectors; and of the third, Pecten flexuosus and fusciuscula, Linn. Linnaeus divided the genus into two sections only:—the first containing the species with the auricles equal or nearly equal; the second consisting of those which have the auricles unequal. The species cited as examples of the first and second division of Limnaeus will serve as illustrations of this arrangement.

M. de Blainville separates the Pectens into four subdivisions:—1. (Les Pelerines) those species which are very inequivalve; the left valve being very flat (Pecten Jacobinus, &c.). 2. (Les Soles) Equivalve species which do not gibbous (Pecten Pleurorectes). 3. Species whose two valves are nearly equally concaev, but the right rather the least, and having its inferior auricle less wide than that of the left, so as to produce a sort of notch, for the passage of the byssus, as he thinks (Pectens gibbus and glaber). 4. Species with stræ parallel to their border (P. orbicularis, fossil).

Mr. G. B. Sowerby makes the divisions five:—1. Both valves convex, equal or nearly in size (Pecten turbidus). 2. One valve flat, the other deep or convex (P. Jacobinus). 3. Both valves rather convex, not meeting all round (P. Pleurorectes). 4. Both valves convex, but unequal in size (Pectens bifrons and aurantiaceus). 5. Irregular, apparently adherent by the outside, but only taking the form of whatever it is attached to in consequence of being close pressed to it (Pecten Fusus, Hinnites).

The same author states his belief that all the Pectens are attached by a byssus, although it is seldom observed, even in the living specimens. He accounts for this circumstance, however, by supposing that their attachment by the byssus is very slight, and that he has seen them attaching their thread by means of their small and slender foot.

Many of the Pectens, he adds, have a row of small sharp teeth on that side of the shell under the ear which forms a part of the sinus for the byssus. He had in a previous number of his Genera stated his certainty that Lima is attached by a byssus, but, as far as he could ascertain, Pecten is not. (See Lima, post.)

The following examples will illustrate the genus:

Pecten Jacobinus.—Shell inequivalve, rather flattened above, with from fourteen to sixteen angulated rays; those of the lower valve longitudinally sutured. Often agreeably variegated.

Pecten gibbus.—Shell subequivalve, ventricose, &c.

Pecten Pleurorectes.

Locality.—The seas of Europe. (Fossil in Italy.)

Pecten Jacobinus.

Pecten Pleurorectes.

Locality.—East Indian Seas. (Fossil in France, &c.

Pau Trois Clutaines, department of Drome.)

* Mr. Gray's Pecten vitreus, which has the priority, was published in the Appendix to Captain Perry's 'Voyage' (1824), among the animals which were found within the Arctic Circle. It is smooth, and different from Captain King's P. vitreus.
Hinnites Pusio (Pecten Pusio—P. distius of some) being the last. The same author, in his Genera, speaking of P. Pusio, says, 'Irregular, apparently adherent by the outside, but only taking the form of whatever it is attached to in consequence of being close pressed to it. This has generally been thought to belong to the Spondylidae, and has been named Hinnites by Defrance. We have however proved it to be a Pecten. See Zoöl. Journ.' M. Rang notices Hinnites as fossil only.

M. Deshayes, in his last edition of Lamerec, thus defines the genus:

Animal unknown.

Shell oval, irregular, adhering by the right valve, inequivalve, subequivalve, perfectly closed; its upper part terminated on each side by auricles similar to those of Pectens; cardinal border straight, toothless, prolonged with age into a small heel (talon); ligament thick, contained in a narrow and very deep gutter (gouttière).

Hinnites forms one of the intermediate links serving to connect the Pectens to the Spondylidae and Ostrea, but that it has more analogy with the last than with any others of the same family. The shells forming the genus are, he says, irregular, inequivalve, and adherent by the right valve, which is generally larger and deeper than the other. Its summit (umbo) is sufficiently regular, which indicates that in its youth the shell has more regularity. The greater part of the lower surface is very irregular, and exhibits a large adherent surface. The upper valve is flattened, more regular, and presents strie, or longitudinal furrows, which are more or less numerous and scaly according to the species. The hinge is nearly similar to that of the Pectens; it is accompanied on each side by short ears, which are nearly equal and very close, so as to leave no passage for a byssus. The cardinal border is straight, thicker than in the Pectens; the gutter of the ligament is much narrower, much deeper, and more prolonged superiorly, which gives it some resemblance to that of Pedum; in age the cardinal border offers a plane oblique surface, comparable to that of Pedum and Spondylus, and which is not remarked in the Pectens. The muscular impression is very large and rounded, and the piallial impression, as in Spondylus, is very much approximated to it. A small number of species only belonging to the genus is as yet known, and a single living species (Hinnites sinusus, Pfeil; Pedum sinusus, Pfeil, Lam.; P. Pusio, Pennant, Sow.; Ostrea sinusus, Gmel., Maton, and Rackett) has been recorded.

The fossil species, four or five in number, come from the tertiary beds of France and Italy.

Thus far M. Deshayes. M. G. B. Sowerby, in his memoir in the 'Zoological Journal' above alluded to, describes another recent species, Hinnites costularius, from the collection of the late lamented Dr. Goodall at Eton. The specimen, when Mr. Sowerby wrote, had been lately brought to England from the eastern coast of Africa. Some Seriulæ and a Balanus were attached to it.

Example, Hinnites sinusus, Pecten Pusio of authors.

Description. A small, unequally sinusous, variegated with brownish orange and white, and marked with numerous very narrow, striiform, and scaly ribs. Locality. The British Ocean and British Channel.

Genetic Character. Animal oval, having the lobes of the mantle separated nearly throughout their extent, larger than the valves of the shell, and turned inwards (se reversant en dedans); this part of the border is wide, and furnished throughout its extent with numerous tentaculæ.
Lamarck, the number of recent species is only 6, but this
seems to be below the mark; for instance, neither Lima
tenera (Turton) nor Lima Locombi is there noted.

_Example_, *Lima squamosa._
Shell oval, depressed, clipped as it were anteriorly, why:
ribs squamous, rough as a file; hinge oblique, marge
granulate.

_Locality—_Seas of America.
There is a variety which has the scales less numerous.
triangular short palps, fixed by one of the sides of the triangle and free otherwise; they are striated like the brachio-

mussela, the upper valve flat and striated longitudinally; the lower valve largest, with the lateral edges turned up and raised above those of the upper valve.

There is a smaller variety, much more round, and generally more delicate.

Locality.—East Indian Seas (Isle of France, &c.). M. Quoy and Gaimard found the species at the island of Vanik-

koro, where it was abundant, living partially encased in Madrepores, especially Astraeae. M. Quoy is of opinion that it is capable of hollowing out the holes in which it is found for itself, and he found young and old individuals burrowed in the same mass of Madrepore proportionally to their size. M. Deshayes suggests whether the animal having first attached itself to the coral, the growth of the latter may not partially envelop the shell.

Shell of Pedum Spondyloideum.

Pinctatula, Spondylus, &c. will be treated of under the title Spondyloidea. We now shall draw the attention of the reader to some rough forms, most of which Limnaeus included in his fourth section.

OYSTERS.

Gryphaea (Lam.), fossil principally, Exogyra (Say), fossil only. These two generally are so established in fossil catalogues, that it may be convenient to retain their names; but we agree with Mr. G. B. Sowerby and M. Deshayes, that, physiologically considered, they ought to be abandoned. Mr. Sowerby, in his Genera, remarks that the particular points upon which Lamark depends for his distinction between the Gryphaea and Grypha, are 1st, the brachio-
mussel. If the latter becomes free, which it is impossible to distinguish between one and the other; moreover, both become free as they advance in size; and if the Gryphaea are then apparently more regular, it is because in their young state they have lived in situations where they could not become attached to small regular objects, while the Ostreae, having lived in more rugged and irregular situations, and necessarily remaining attached for a longer time, have partaken more of the regularity of their native situation.

Indeed, adds Mr. Sowerby, there is sufficient evidence that an oyster, when by any chance it becomes attached to a small smooth object, where it is comparatively immovable, and in a large series of species and varieties it would be impossible rationally to draw the line between the two genera. Indeed, the difficulty of drawing this line is increased when we perceive the all the forms of both genera in the same species. M. Deshayes goes on to state the observations of Lamark, that in the Gryphaea the shell is free: this, says M. Deshayes, is an error; there are Gryphaea which affixed themselves to solid bodies like the oyster, and there remained during the whole of their existence; and the others were fixed for a longer or shorter period in their youth only, and only became free as they advanced in age. This observation will apply equally to many species of oysters, and particularly those which live on muddy or sandy bottoms. In the oysters, as in the Gryphaea, the valves are unequal, and in both genera the left valve is always largest. The involute spiral curve of the umb of Gryphaea is perhaps the strongest point of distinction, and it certainly is constant in many species; but in all it is not. In this respect the variations are comparable to those of Gryphaea. If the involution exists in the Gryphaea, it exists also in the Ostreaform Gryphaea. The hinge and muscular impression in both Ostrea and Gryphaea are so similar, that M. Deshayes expresses his surprise that Lamark could be induced to establish so useless a genus.

But if the generic claims of Gryphaea be untenable, those of Exogyra, established by Say for the reception of the Gryphaea, whose umb, instead of rising above the valves, take a lateral direction, have still less foundation. "There is not, says M. Deshayes in conclusion, a single character which is not to be found in the ostraeas, and sometimes in the varieties of the same species. (See further, Ostrea, post.)

Geological Position. — Gryphaea are found in almost all the strata down to the lime (inclusive).

The so-called species are numerous. Thirty-four are enumerated by M. Deshayes in his last edition of Lamark, and of these only one, Gryphaea angulata, is recent. In the Tables of M. Deshayes, the number of living species consists of this unit, and of fossil (tertiary) three species.
are there recorded. The reader may consult the catalogues above noticed for fossil species and localities.

Eogyra is included in the species of Gryphaea noticed in the last edition of Lamarck. Von Buch has recently published the species under the genus Eogyra. The species, from Montan (South America), where it was collected in company with Pectens by M. Alexandre de Humboldt.

**Eosynia**

**Generic Character.** Animal oval, oblong, flattened, often irregular; lobes of the mantle thick and fringed on the borders, separated throughout their extent; no foot; mouth moderately furnished with two pair of elongated lanceolate palps; branchial large, curved, nearly equal. The heart is placed near the base of the intestine, which last terminates behind the adductor muscle by an anus which flows between the lobes of the mantle.

**Ostrea** (Linna.)

**Shell adherent, inequivalve, irregular, umbones distant, and becoming very irregular as the animal advances in age. Upper valve smallest, gradually displacing itself, and advancing forwards as the animal grows older. Hinge toothless; ligament semi-internal, inserted in the cardinal pit of the valves; the pit of the lower valve increasing with the age of the animal, as well as the umbones, and acquiring sometimes a great length.

**Geographical Distribution.** Very wide, and principally in the seas of temperate and warm climates: no species appear to have been noted in the Polar regions. As far north. Oysters have been taken on gravel and sand, in estuaries, and on the sea-coast, sometimes attached to rocks, trees, &c., at depths varying from the surface to 17 fathoms. In the British Museum there is a good sized crab, on the back and claws of which are many oysters.

**Eosynia**

There is a species Eosynia is a true as a general proposition: but it wants exactness when once comes to examine in detail a great number of individuals of the species. If the oysters in general have a tendency to extend themselves, nearly all take different shapes according to the form and extent of the individual. In the Eosynia, for instance, the forms belong to the oysters properly so called, to the Gryphaea, and to the Eosynia. It is very different in the Gryphaea, and in the Gryphaea. If, on the other hand, we compare the young individuals with the young oysters, we find no difference. Take at the point of departure Gryphaea arcuata, a species the umbos of whose lower valve is the most elevated, and we shall find an insensible passage to the oysters properly so called, established by many species in which this part, becoming less and less projecting, finishes at last by disappearing in this form to take that of the oysters; this transition is so insensible that we regard the rational limit of the two genera as impossible.

M. Buch states that the Gryphaea have a lateral lobe, but this lobe is no more constant than the other characters, and is of no more value than they are. There are species in which it is scarcely marked, others in which it is deeper, both in some individuals it is altogether wanting. This lobe, regarded as characteristic by M. des Byuch, is also found in the oysters, and so common to the two genera which he would separate; it also shows itself in some Eosynia: the small degree of constancy which it renders it unimportant and valueless. The Eosynia, and the Gryphaea pass have a tendency to take a dorsal suture. We shall first observe that the Gryphaea pass have a dorsal suture, Say, has never any keel; and next, that it is absent in many other species. If some Eosynia have a dorsal keel, others have it not; the character then cannot be regarded as a very constant one; this renders it insufficient to bin the new genus. Nothing then remains as a characteristic but the form of the umbo. In Eosynia it is rolled on itself laterally; in Gryphaea it is elevated upwards. In the respect the examination of the Eosynia becomes interesting.

Many species of oysters have the umbo; others, which have it ordinarily straight, have accidentally this part equally turned laterally; the Eosynia bear such resemblance to the oysters, that it is impossible to trace the limits of those two groups. But the Gryphaea pass have a deeper and broader form, the latter having a greater lowering of the umbo, they pass also to the Eosynia by a certain number of species with the umbos of the Gryphaea and Eosynia not more close than that between the oysters and Gryphaea on the one hand, and the oysters and Eosynia on the other. Thus the Gryphaea and the Eosynia are not two diverging branches of the oysters, but these genera form a circle in which we pass from one to the other. The Gryphaea is the Gryphaea, and from the Eosynia to the Gryphaea by insensible gradations. The intimate relations which connect these three genera, the coexistence of their characters, the manner in which, so to speak, they penetrate each other, all accord, in my opinion, the most convincing proof that these three genera are separate, not related, form, when reunited, one very natural genus; nor can we agree with M. des Byuch, that they are separate in a manner "nella, picte, et tranche.

M. des Byuch considers the umbones of certain Gryphaea and the enlargement observable in some oysters (Ostrea costata) as analogous parts to the auricles of the Pectens. I am far from partaking of the opinion of the learned geologist. I perceive too great a difference between the two series, to think that the series could be united to form one species without alteration in the parts of their organization to admit in one the parts of the other in a certain state of modification. The part of the mantle which in the Pectens produces the auricles, is a part not found in the Gryphaea; and forms the lobe in the Gryphaea. All the Pectens, with the auricles united, are a species; and all the oysters, without exception, are irregular and want auricles like those of the Pectens. In the oysters, as M. de Byuch (Ostrea carinata), and other analogous species, the enlargement of the upper part is due to the position of the muscle upon this enlarged part, and to the adhesion of the shell on this enlarged part. It cannot therefore be compared to the auricles of the Pectens, for they have no reference to the adductor muscle. When we know the differences between the animals of the Pectens and oysters, we cannot admit the constancy of M. des Byuch, that the oysters are Pectens without auricles, having them horizontal, whilst the Gryphaea have only one represented by the lateral lobe, the other being abortive as a consequence of the insensible transition of the shell to the forms of the oysters. Without pursuing the argument of M. des Byuch further, we must conclude this discussion, which is of high interest to those who seek for the principles on which generic distinctions should be founded, as we began it. Gryphaea and Eosynia are two names satisfactorily used by zoologists and geologists as sub-divisions of this general genus, and is convenient but arbitrary subsections: that they have no claims to separation from the oysters, as distinct types, we cannot admit.

The True Oysters have been divided into two groups, each may be satisfactorily used by zoologists and geologists as subdivisions of this genus.

**A. True Oysters with simple or undulated, but not plaited valves.**

This considerable group, which consists of between three and forty recorded species (recent), may be illustrated by the
well known *Ostrea edulis*, or Common edible oyster of the European seas.

The delicate oysters are the *Ostrea* of the ancient Greeks; *Ostriche* of the modern Italians; *Ostras* of the Spaniards; *Estrum* of the Germans; and *Huitres*, in the French.

The ancients Roman epicure well knew the value of the British oysters (Juvanell, iv, 140), nor have they lost their celebrity in modern times.

But excellent as the oysters of Britain undoubtedly are, there are many degrees of that excellence, the animal varying much both in size and flavour, according to the nature of the coast and the food with which the locality is furnished. The oysters on the south coast are generally very well flavoured; but it has been said that the best are found at Purfleet and the world, and from these districts. The taste, indeed, may vary in using any rather coarse; but when it is well-flavoured, and excellent when well stewed or pickled. Colchester and other places in Essex are the great nurseries or feeding grounds for supplying the metropolis, and indeed, in a great measure, England generally, with these highly-flavoured varieties. Here the oysters are cultivated at various places on the coast, even as far as Scotland, are brought and laid on beds in creeks along the shore, where their flavour and size are rapidly improved. They have been known to augment the circumference of their shells even to the extent of an inch or more during the first two months, but in such cases the concavity within the valves is shallow. Bishop Sprat, in his *History of the Royal Society*, gives a detailed account of the treatment of oysters in the beds or layers.

The favourite food of the oyster, according to M. Guillon, consists of a green *Navicula (Vibrio navicularis*) and various species of that and other genera of *Infusoria*: these make the oyster fat, tender, and peculiarly well-flavoured; others again are said to be injurious to it.

The number of vessels employed in dredging for oysters is supposed to be about 200, giving employment to some 400 or 500 men and boys; and the quantity of oysters bred and taken in Essex, mostly for London consumption, has been stated at 14,000 or 15,000 bushels annually.

Property necessarily exposed, as these valuable oyster-beds must be, the protection of the legislation. (1843, 31 George III, c. 51; 48 George III, c. 144; and 17 & 18 George IV, c. 29.) By the last-named statute, (which repealed 31 George III, c. 51), sea or strand-harvesting of oysters or oyster-brood from any oyster-bed, lay or fishery, is larceny, and the offender upon conviction shall be punished accordingly. Moreover, if any person shall unlawfully and wilfully use any dredge, not, &c., for the purpose of brood or oyster-brood, within the limits of any oyster-bed or fishery, every such person shall be deemed guilty of a misdemeanor, and, upon being convicted thereof, shall be punished by fine or imprisonment, or both, such fine not to exceed 20l., and such imprisonment not to exceed three calendar months.

The statement contains that the catching of floating fish with any net, instrument, or engine adapted for catching such fish, within the limits of any oyster-fishery, shall not bring the fisher under the penalties of the Act.

For the protection of the oyster-fisheries in Scotland, now (April, 1840) before parliament, provides that no person in Scotland knowingly stealing oysters from a bed, lay or fishery, which is sufficiently marked as the property of others, shall be deemed guilty of theft, and punishable accordingly; and that any person using any net, dredge, or other instrument, within the limits of such oyster-fishery, for the purpose of taking oysters, although none be actually taken, shall be deemed guilty of an attempt to commit theft, and liable to fine or imprisonment, the fine not to exceed 20l., and the imprisonment not more than six months, with a clause that nothing in the act shall prevent persons from catching floating fish in an oyster-fishery with instruments adapted for taking floating fish only.

The oysters, with the borders of their valves distinctly plaited.

Of this group, consisting of more than thirty recorded species (recent), *Ostrea Crista Galli*, the Cocksmoke Oyster, will serve as an example.

*Description.*—Shell varying in form according to the bodies to which it adheres, but generally somewhat rounded, very much plaited, the plait longitudinal and angulated; internal border rough; externally violet, purplish, or reddish-white. The shell externally has subgranulose strips, and rarely elevated subulobate cresses.

*Locality.*—East Indian Seas.

The number of species of *Ostrea*, excluding *Gryphaea*, given by M. Deshayes in his Tables, is 54 living and 72 fossil (tertiary). The species there recorded as both living and fossil are *Ostrea Cornucopiae*, *edulis*, *Virginiaca*, *Hippopota*, *narciscus*, *Forskala*, and a new species.

In the last edition of Lamarck the number of recent species, some of which may be varieties, is 52, and the number of fossil only 52.

The fossil species occurs as low down as the littoral (inclusive), and some of the species are considered characteristic of certain strata, *Ostrea dilatata*, for instance, of the Kieweno clay, or oak-tree clay of Smith, and *O. pulchra* of the plastic clay.

*Placuna.* (Brug.)

Animal very much compressed.

Shell free, irregular, very much flattened; valves delicately and almost transversely, quite transversely, in some species, nearly equal, and subequilateral; hinge internal, offering on one valve two longitudinal, trenchant, rib-like elevations, converging at the summit, and, on the other, two furrows, corresponding to these ribs, and giving attachment to the ligament, muscular impression subcentral and rather small. (Linn.)

*Geographical Distribution.*—The seas of warm climates: the species now known are from the East Indian and Red Seas, and have been taken on sandy bottoms.

M. Deshayes remarks that the animal is not known, but that he is convinced that it has a general analogy to that of *Anomia*.

The number of species recorded in the list of M. Deshayes is three living and one fossil (tertiary). Of the living species, *Placuna purpurea* is noted as both living and fossil (tertiary). Four species are enumerated in the last edition of Lamarck as they were in the first; but the fourth, *Placuna pectinoides* (fossil), is considered to have all the characters of *Placata*, and is therefore removed by M. Deshayes to that genus. Mr. C. B. Sowerby had previously given a similar opinion. (Genera.) The species best known are, *Placuna Placenta*, vulgarly known as the *Chinese Window Oyster*, the valves of which are sufficiently delicate to

*The expression in Lamarck is, 'est trouvée a Stone en Egypte, presque fossee.'
transmit light; and **Pacuna Sella**, known to collectors as the Saddle Oyster (from Tranquebar, &c.).

**Example.** *Pacuna Placenta*.

**Description.**—Shell suborbicular, flat, pellucid, white, with longitudinal, subdecurate striæ.

**Locality.**—East Indian Seas.

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**surface of the shell.** (Brodiep, *Zool. Proc., February, 1832.*

**Geographical Distribution, &c.**—The species are widely distributed, and inhabit the seas of warm climates in both hemispheres. Mr. Broderip has described four (*Zool. Proc.* and Müller’s *Synopsis*) brought to this country by Mr. Cuming from the West Indies, Central America, and other western localities. They were dredged from sandy and muddy bottoms, adhering to bivalve shells, dead living, and dead coral; at depths of six, eleven, and seventeen fathoms; of these, *Pacuna echinata* wears something of the appearance of the short-spined *Spondylus*. Besides the species above alluded to, Mr. Broderip states that Mr. Sowerby furnished him with an odd valve of a large species from Lopouma, which was beautifully undecurled internally, but as it was believed that this was identical with the shell sold by him to the British Museum, Mr. Broderip left the description of it to the officers of that establishment. Mr. Sowerby had some other odd valves, which Mr. Broderip thought might prove new, and the latter possessed two or three specimens adhering to *Spondylus*, from an unknown locality; but they appeared to be young, and though he was inclined to think that there was a new species among them, he deemed it prudent to wait for further information.

M. Dohays remarks that this genus establishes the passage between *Pacuna* and *Anomia*; and that, that the V-shaped tooth of *Pacuna* is only an extreme modification of the large callosity of *Anomia*; he adds that a fossil shell found in Egypt, and which has been taken for *Pacuna*, is a new step, as regards the hinge, between the *Anomia* and *Pacuna*.

**Example.** *Pacuna Cumingii,* Brod.

**Description.**—Shell subround, obscurely striated, with a few prominent, rather large, teeth, blunt, slightly imbricated, the hinge very strong; two inches and a half, breadth seven-tenths of an inch, height two and three-quarters inches.

**Locality.**—Shores of Central America (Gulf of Dicke, Province of Costa Rica); dredged from a muddy bottom, at the depth of eleven fathoms, attached to dead bivalve shells and dead coral.

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**Placuna Placenta.**

**Placunopsis.** (Brod.*

**Generic Character.**—An animal probably intermediate between that of *Pacuna* and *Anomia*.

**Shell** adherent, subequivalve, irregular, flattened, plaited towards the margin, vitreous internally. *Hinge* internal, with two elongated, thick, subcurred, divaricated teeth converging at the base in the lower valve, and two ligamentiferous furrows opposite in the upper valve. *Lower valve* superficially fissured externally towards the hinge, the subosseous organ of adhesion inserted between the lamina of the shell and filling the fissure externally. *Muscular impression* in each valve subcentral. In the upper valve the impression of the organ of adhesion is superadded.

This interesting genus partakes of the characters of the genera *Ostrea*, *Picutula*, *Placuna*, and *Anomia*. It may be regarded as the connecting link between the two latter. With an arrangement of the hinge approaching very nearly to that of *Placuna*, it has the distinguishing organization of *Anomia*, while the external appearance of the shell, especially if viewed in situ, bears the strongest resemblance to *Picutula* or some of the pliated *Ostrea*. The organ of adhesion, which in its bony character (for it is more bony than shell) resemles that of *Anomia*, does not perforate the lower valve directly, but is inserted between the lamina of the internal surface of the lower valve above the muscular impression and below the hinge, and passes out into an external, irregular, somewhat longitudinal superficial fissure or *exostaxis*, which is narrowed at the hinge margin, and which it entirely fills to a level with the surrounding

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* M. Dohays (last edition of Lamarck) erroneously attributes the establishment of this genus to Mr. Sowerby. The error is perpetuated in the useful *Iconographie Marine* of Mr. R. Sowerby, &c.
on the shores of the Mediterranean, and both Mr. G. B. Sowerby and M. Deshayes make the same observation.

The number of species recorded by M. Deshayes in his tables is ten living and eight fossil (tertiary), and of species both living and fossil (tertiary), two, viz. Anomia Ephippium and Electrica.

In the last edition of Lamarck only nine species (recent) are mentioned, and but one fossil only (A. lenticilirata); indeed the specific names of some of the fossils noticed in the tables, costata, dubia, and striata, recall to the observer the remarks made by zoologists touching the varied nature of the surface of these shells according to accidental circumstances.

The fossils are found in the crag and London clay, and in the marine formations above the chalk in France.

Lamarck considered the animal of Anomia (Echion of Pali) as closely allied to that of the Oyster in its organization; but M. Deshayes observes that he does not agree in opinion with those zoologists. The Anomia, he thinks, furnish very interesting materials for study, and he believes that they approximate to the Tercebratula, at least as much as the Oysters, and may probably be animals belonging to two groups, and serving as the passage from one to the other. If this be so, he adds, the genus would not be greatly changed in its methodical position; for if Cuvier and his imitators have separated these genera too widely, Lamarck and some others, following the inspiration of Linnaeus, have approximated them as much as is their still small knowledge of the animals would permit.

Example, Anomia Ephippium.

Description.—Shell suborbiculate, rugoso-plicate, waved, planulate, with an oval orifice, whitish or yellowish, often reddish yellow, below. One of the largest species.

Localities.—British Channel; Mediterranean; Atlantic Ocean.

PEDAL. In musical instruments Pedals are of two kinds:—1, those keys which are acted on by the feet of the performer; 2, the levers acting on the swell of the organ, and on the stops; and also those of the piano-forte and harp, the uses of which are too well known to require explanation.

The Pedals, or foot-kers, of the organ were invented in the fifteenth century, by a German named Bernhard; but it was long before they had travelled beyond the confines of the country to which they owed their birth; and, strange to say, England was the last to adopt them, though the first to introduce the organ generally into the churches. But by slow degrees their utility and importance were discovered and acknowledged, and now no organ, except of small dimensions, is built without these most desirable auxiliaries, and no organist is esteemed who is not tolerably well skilled in the use of them.

PEDAL BASE (or Pedale, in music), is a base which remains stationary on one note, while the other parts continue moving and forming various chords, all of which, however, must be related to the holding note, according to the laws of harmony.

Example:—

PEDALIACEAE, a small natural order of monopetalous Exogens, very nearly related to the Verbenaceae order, having like it irregular and usually dissymmetrical flowers and a few seeded 2- or 4-seeded fruit; but differing in having the radicle directed towards the base instead of the apex of the fruit. From Bignoniaceae, with which they are more generally compared, their wingless seeds offer the principal distinction. They are all exotic tropical herbaceous plants, with opposite leaves and axillary flowers, and are of little known use, with the exception of the genus Sesamum, whose seeds afford a bland oil not inferior, when fresh, to that of the olive. [Sesamum.]

PECTUNCULUS. [POLYDOTA.]

PECULIAR. [WILL.]

Anomia squamata.

Peculiaceae.

1, the corolla laid open; 2, the pistil; 3, the ripe fruit; 4, a transverse section of the latter.

A shoot of Josephinia imperatricis in flower.
Some fanciful explanations have been given of the word. But perhaps the true etymology is as follows: Greek περηκτής or περήκτης, for περηκτής, the word περζ, or περζ, being much used in the law Latin of the middle ages to denote summaries, or the ultimate result in any transaction as a perexit finium and pedes compoti. So that a pedeites as, an epitome of information or evidence respecting descents and kindred.

The Scripture genealogies, as they are called, are so many pedigrees, but with this difference from the proper idea of a pedigree, that they are not tabular, but narrative.

Tradition and genealogies, both of the ancient and modern times, are not of very frequent occurrence in the writings of the middle ages. But they are sometimes found in public records, and in the evidences of private families, or entered in the chartularies of the monastic foundations. They are generally short, containing for the most part only the matter as was wanted for the exhibition of some particular claim of right. But at about the beginning of the sixteenth century, when the College of Heraldes began to pay more attention to the genealogy of the English families in reference to their right to arms, which the right to armorial insignia gives, many pedigrees were compiled, and in the course of that century the heralds obtained copies of all such accounts of the English families of any distinction as could be supplied to them, and made use of such as were desired in the compilation of the books which contain the record of their official proceedings. To obtain information of this kind, it was the practice of the heralds of that century, and it continued to be their practice about the year 1660, to which time, according to the heralds, one George Markham, a clergyman of England late in time to this day, and to collect from the mouths of the principal persons of each county what they knew of the changes which had taken place in the family since the time of the preceding visitation, or what account could be given of themselves by families who had never been stepped into the rank of gentry, or who had become recently settled in the county. The pedigrees thus collected are in the visitation books at the College of Arms, and form a vast body of this species of information highly important to those who are interested in critically the biography of the distinguished persons of the English nation.

Besides this grand collection of pedigrees, there are many similar collections made by private persons, or by the heralds themselves in their private capacity. Many such collections are in the library of the College of Arms; others are in the British Museum; others in the hands of private persons. Copies of the visitation books also are often to be found. The largest collection of copies is in the British Museum, though copies of some of the best visitation books are not included in the collection that is here deposited. There are many copies in the libraries of Queen's College, Oxford, and Caius College, Cambridge.

Since the visitations were discontinued, there has been no official and regular collection of pedigrees. But there has been a general tradition made of the records in the visitation books by the entry in the books of the Heralds' College of their pedigree by particular families. In some cases, as of peers, this is compulsory. When a grant or dignity conferred, it has been usual for families to record in the college that they have received descent and alliances. But the books are open to any private family, who may, at a moderate expense, enter a pedigree showing the existing state of the family, and whatever a family have received by gift or by purchase, or in any other way, may be proved by sufficient evidence. The entries thus officially made are matter of record, and contain information which is often very interesting to the postrity of the persons so occur in them, and may be of importance in protecting the rights which better tocompromise the title. But the books are open to any private family who may, at a moderate expense, enter a pedigree showing the existing state of the family, and whatever a family have received by gift or by purchase, or in any other way, may be proved by sufficient evidence. The entries thus officially made are matter of record, and contain information which is often very interesting to the posterity of the persons so occur in them, and may be of importance in protecting the rights which better to compromise the title.

The authors of the books of topography have done something to supply the loss of this kind of information, the county by the disuse of the visitations, such as was usually containing notices of the families who have possessed the most important interests in the district to which the work relates.

PEDIMENT. [CIVIL ARCHITECTURE] PEDIPES. Adamson's name for a genus of turbate shells belonging to the family Curculionata of M. de Beaup.

Generic Character. Animal furnished with five form testacles, implanted vertically on the head and diverging, eye oval and situated within and at the base of the tentacles;
foot elliptical, divided into two portions by a wide transverse frowny; mouth furnished with an upper piece corresponding to a lingual mass armed with small hooks.

Shell globular or oval, thick, summit projecting but little; last whorl of the spire larger than all the others united; aperture long; oval, or linear, with disunited borders; columella solid, furnished with two projecting laminae; a third very much elevated on the convexity of the penultimate whorl; external lip trenchant and furnished sometimes with small ribs within.

One of two recent species only are known: they are small. Example, Pedius Adamsiti. See Adams, Seneg., l. f. 4.

PEDLAR. This word is said by Dr. Johnson to be a contraction from petty dealer, formed into a new term by long and familiar use; and a dealer is a person who travels the country with small commodities. The same writer defines a hawk to be 'one who sells his wares by proclaiming them in the street.' In legal understanding however a hawk is an itinerant trader, who goes about from place to place, and sells and peddles, but he is only a hawk in small wares. In the various acts of parliament which impose duties upon them and regulate their dealings, they are always named in conjunction as hawkers and peddlers; and no distinction is made between them.

It has been for more than a century the policy of English law to consider the conduct of trade by means of fixed establishments as more beneficial to the public than that of itinerant dealers; and it cannot be denied that the local traders in goods and services are a character than one who continually travels from place to place, there is a greater security for the respectability of his dealings.

In conformity with this policy, statutes have been passed from time to time, obliging hawkers and peddlers to take out licences, and be subject to regulations and restrictions, which are supposed to protect the resident trader as well as the public from unfair dealing. These reasons however have been given ex post facto to justify the laws against hawkers and peddlers, and it must be admitted that hawkers and imposed these duties appear to have merely contemplated a means of increasing the revenue. (5 and 9 Will. III., c. 25; and 9 and 10 Will. III., c. 27.)

The provisions by which the licences to hawkers and peddlers are now regulated are contained in the statutes of George III., c. 41. By that Act, the collection and management of the duties on hawkers and peddlers in England was given to the commissioners for licensing and regulating hawkeye coches; but this duty has since been transferred to the commissioners of stamps by the 75th section of the statute 1 and 2 Will. IV., c. 22. By the provisions of the latter statute, 'all the powers, provisions, regulations, and directions contained in the statute 50 Geo. III., c. 41, or any other act relating to the duties on hawkers and peddlers, as are now contained in the powers, provisions, regulations, and directions, forfeitures, pains and penalties imposed by any acts relating to the management of duties on stamps, so far as the same are applicable to the duties on hawkers and peddlers, are declared to be in force and effect, and are to be uniformed and put in execution for securing and collecting the last-mentioned duties, and for preventing, detecting, and punishing all frauds, forgeries, and other offences relating thereto, as fully as if they were enacted under a penalty of 5s.'

The duty of granting licences to hawkers and peddlers and enforcing the law against such persons is now therefore entrusted to the commissioners of stamps; the particular conditions and regulations under which such licences are granted are contained in the above-mentioned statute 50 Geo. III., c. 41.

Before a licence is granted to a person desirous of trading and travelling as a hawk or pedlar, the applicant must produce to the commissioners of stamps a certificate, signed by the officiating clergyman of the parish in which he resides, attesting that he is of good character and a fit person to be licensed. Upon this certificate being given, the commissioners grant the licence, which is only in force for one year, and the party who receives it is required to pay a duty of 5s. on foot or on wheels alone, and an additional duty of 5s. per annum if he travels with a horse, ass, mule, or other beast bearing or drawing burthen; and these duties are to be paid at the time of receiving the licence. All personal who act as hawkers or peddlers without such a licence are liable to a penalty of 5s. Among other regulations, the hawker or pedlar is required by the Act to cause to be written in large legible Roman capitals, upon the most conspicuous part of every pack, box, bag, trunk, case, cart, or waggon, or other vehicle in which he carries his goods, and to every room and shop in which his goods are kept or sold, and also upon every handbill or advertisement given out by him, the words 'Licensed Hawker,' together with the number, name, or other mark of his licence, and in case of his omission so to do, he is liable to a penalty of 10s.; and every unlicensed person who places these words or any other words which his goods is liable to a penalty to the like amount. A hawker and pedlar travelling without a licence, or travelling and trading contrary to or otherwise than is allowed by the terms of his licence, or refusing to produce his licence when required to do so by inspectors appointed by the commissioners, or by any magistrate or peace-officer, or by any person to whom he shall offer goods for sale, is liable in each case to a penalty of 10s. A person having a licence, and hiring or lending it to another person for the purpose of trading with it, and also the person who so trades with another's licence, are each liable to a penalty of 10s. A hawker or pedlar dealing in or selling any smuggled goods, or knowingly dealing in or selling any goods fraudulently or dishonestly procured, forfeits his licence, and shall be ever afterwards incapacitated from obtaining or holding a new licence.

By the statutes of Geo. III., c. 41, that, if any person shall forge or counterfeit any hawker's or pedlar's licence, or travel with, or produce, or show any such forged or counterfeited licence, he shall be liable to a fine of £100. (Cline's Commercial Law, vol. ii., p. 163: Burn's Justice, tit. 'Hawkers.')

PEDOMETER, the name of an instrument by which a person may tell what space of ground he has walked or ridden over. It is made in the shape of a small watch, and may be conveniently carried in a pocket. There have been several instruments of different construction invented for this purpose, but all others have been superseded by that invented a few years ago by Mr. Payne, watchmaker, of Bond Street.

The construction of the instrument will easily be understood by reference to the accompanying diagrams: fig. 1 is a front view, with the dial-plate removed, to show the works beneath, and fig. 2 a back view.

Motion is communicated from the traveller to the machinery of the pedometer by means of a horizontal lever L, fig. 2, which is furnished with a weight at one end and a pivot or axis at the other; under the latter is a spring S, which keeps the lever close up to the regulating screw R; this spring is so arranged as to be only just sufficiently strong to overcome the weight of the lever and to prevent its falling downwards.

When the body of the traveller is raised, either by the
spring of his foot or the motion of his horse, the lever is impelled downwards by the jerk, and immediately returned to its place by the spring, and so long as the motion is continued the lever is constantly in a state of vibration. Fixed on the axis, X, of the lever, and moving with it, is a small ratchet-wheel, A; beneath this is another and larger ratchet-wheel, B, which fits on the same axis, but is not attached to it. These two wheels are connected together by a ratchet or pulley, in such a manner that when the lever falls, both wheels are moved forward one or more teeth, but when the lever rises, they come to the form of the spring. S, the second ratchet-wheel, B, is held stationary by the ratchet or pulley, P. This wheel, B, is connected with a series of toothed wheels and pinions, C D E (fig. 1), by means of a pinion, F, fixed on its under surface. The centre wheel, E, carries a hand or peg, which points to the figures upon the dial-plate to denote the number of miles passed over.

These instruments are generally made to register ten miles, but that of course depends on the number and relative size of the wheels between the lever or motive power, and the index; by placing an extra pinion and wheel in the same manner as for the second hand of a watch, and making the wheel with ten times the number of teeth contained in the pinion, you get a second register, which will mark for every ten miles over the main index hand; the pedometer will then register a hundred miles. The accuracy of the instrument depends upon the proportion which the vibrations of the lever bear to the divisions on the dial-plate, and this can be altered by the small ratchet-wheel, S, and the first ratchet-wheel, B, (fig. 2), placed under the lever.

It is necessary that the pedometer should be carried in such a position that the lever shall be always as near as possible horizontal: for this purpose a small book, H, is placed on the pendant or handle, by which the instrument may be carried in the pocket.

With a slight difference of construction, this pedometer may be adapted to carriage travelling. For that purpose the lever must hang perpendicularly, and it does not require the extra pinion, but may have a long ratchet-wheel, or one which travels forwards like a common pendulum: this is rendered requisite on account of the motion of the carriage being in the opposite direction to that of the body of a horseman or pedestrian, the former being backwards and forwards, while the ratchet-wheel is always downwards.

The works of the pedometer may be attached to a watch, the index being placed in the dial-plate, in the same manner as that of a second hand.

PEDUNCLE. The stem of a plant which is called the stalk of the flower; it is not however, like the pedicle with respect to the leaf, a component part of the flower, but is in reality a branch, usually of an ephemeral nature, and composed of more or less several; in the latter case it bears bracts, which indicate the bractes, and which occasionally produce other branches from their axils; when this happens, such secondary branches are named pedicels.

The naked species of botanists, such as is so ad libitum, this is a long-drawn out but a peduncle which rises immediately from the bulb, and whose first internode is exceedingly long.

Peebles, or Tweeddale, a county of Scotland, bounded on the north by Edinburghshire, on the south by the shires of Selkirk and Dumfries, on the east by those of Selkirk and Edinburgh, and on the west by Lanarkshire. It is situated between 55° 24' and 55° 30' N. lat., and between 2° 45' and 3° 33' W. long. It is:

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With the exception of the parishes situated on the banks of the Tweed, the county is well intersected by roads, and the interchanged letters, which were once numerous, are for the most part kept in good repair. The principal are those from Edinburgh to Tweedmouth; roads to Peebles and Moffat; and Lanark and Kelso.

The eastern portion of the county near the river Tweed, and winds through the valley of that river, is a fertile district, and has been variously computed at 231,320 acres (Armstrong, Companion to Scotch Atlas), 229,778 acres (Findlater, View of Agriculture of Peebles), and 241,186 acres (New Statistical Account of Scotland). The differences between these accounts may in some measure account for the circumstances that the boundary of the county in some parts is very irregular and undefined, particularly the southern-eastern portion, where it is doubtful whether a considerable tract of country belongs to Selkirkshire.

The general elevation of Peeblesshire exceeds that of any other county in the south of Scotland. The least elevated part of the county is near where the Tweed crosses the eastern boundary, which is between 400 and 500 feet above sea level; the highest parts extend from the south-east to the south-western extremities of the county, including the sources of the Clyde, the Tweed, and Annan, the courses of which rivers indicate a general rise in the surface of the lowlands from this part of the county. The only habitations to be seen through the dismal mountain-ranges are the shepherd's cottages in number and widely scattered. On the northern side a ridge of mountains separates this county from Edin-

burgh, and on the north-west it is separated from the county by the Pentland Hills, among which the North Leith Water, the Medwin (a tributary of the Tweed), and the Glentress give rise to the town and parish of Linton, have their rise. The

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The Tweed, the only river of the county, takes its rise from a spring in the upper part of the parish of Tweedsmuir, situated 1500 feet above the sea-level, and rises from whose base issue the rivers Clyde and Annan. In course of its course it is bounded by the Tweed in this part of the county, from which the course of the Tweed is due east, crossing the northern parts of the counties of Kirk and Roxburgh; and after separating Berwickshire from Northumberland, it falls into the German Ocean. It is 60 miles in length, and its course is equally healthy for sheep pasture, and the disease of "illness" is almost unknown; but so soon as the easterly direction, the sheep on the right bank become subject to that disease, and also what is called "dry rot." Eddleston Water, emerging from those on the hills of the left bank, which are not so

The numerous rivulets which intersect the western tributaries of the Tweed. The chief of these are the Lead, which is already mentioned; the Pookies or Eddleston Water, which rises on the west of the parish of Leadwater, and issues into the Tweed near the Earl of Traquair. From the headwaters of the country through which they flow, there are subject to sudden inundations, which, sometimes extending to considerable distances, floods the lower streams, and particularly the Manner, contain, during their season, both salmon and trout. The valley is a level tract of country, from which South Esk takes its rise. It abounds with pike, perch, and the is the resort of large flocks of wild fowl during the summer.

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cipal elevations are Culterfell and Cardon, in the parish of Kilbucho and Glenholm, the summits of each of which is more than 2400 feet above the level of the sea. The Tweed gives rise to the town and parish of Tweedsmuir. The hills and mountains, the last-mentioned parish afford good pasturage for sheep and black cattle; and they are of such easy ascent, that on their summits, whence the country appears as a beautiful green carpet of growing green and yellow, and the islands, the Tweed. The first 20 miles of its course are through a height of 1000 feet. It is marked in the Statistical Account of Scotland, that so long as the river flows, it heeds the streams and Allan Water, which pass into the Tweed, is 15 miles in length, and its course is equally healthy for sheep pasture, and the disease of "illness" is almost unknown; but so soon as the easterly direction, the sheep on the right bank become subject to that disease, and also what is called "dry rot." Eddleston Water, emerging from those on the hills of the left bank, which are not so

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an annual fall of 25.75 inches. The fogs so often met with in the Lothians seldom extend into this county.

The prevailing rock is whinstone, of which there are some excellent quarries in the vicinity of the town of Peebles, and of which there are many short seams. But the whinstone, which is found in other parts, is from its laminated structure, unsuitable for building. This whinstone, as it is commonly called, is a coarse argillaceous schist, the grauwacke of mineralogists. In this county, in its simplest state, it is a fine-grained, more or less argillaceous slate, and is laminated as to afford roofslate. In the parish of Stobo it has been worked for that purpose for a long period. Another sort is a fine grauwacke slate consisting of an argillaceous base intermixed with sand and mica. In a still coarser state it is a greywacke, durable and of common occurrence in the north, and both coal and limestone have long been wrought at Carlops, in the parish of Linton.

The villa of Innerleithen is now much frequented on account of the water of a spring which has long been celebrated for the cure of old wounds, diseases of the eyes, and other complaints. Within a few years, Lord Traquair, the proprietor of the village, has erected a neat and commodious building whence the waters are now supplied to the various inhabitants.

Of the 241,165 acres which, according to the 'New Statistical Account,' constitute the area of the county, the portion under cultivation, or occasionally cultivated, does not exceed 34,762 acres, or not quite one-seventh. Of that which is genuinely under grain, one-third is lost in ruin, due to the imperfections of the soil, which is not generally susceptible of cultivation; and there are 675,525 acres of ununder. In the united parishes of Broughton, Glenholm, and Kilbuke, where one-fourth of the entire surface is under the plough, the value of the arable land averages 25s. per acre. (Scotland.) When supported by the Reformation, the Reformation-ground which has lain for some seasons, the rotation of crops is:—1st, oats or peas; 2nd, turnips or potatoes; 3rd, barley, among which rye-grass and clover-seeds are sown; 4th, hay. The land then remains in pasture for a few years, the crops returning to rotation. Lords are generally granted for nineteen years, but farms purely of the store kind are left for fourteen years only. The chief hindrances to improvement are, the non-residence of the proprietor, the distance from markets, goal, and lime; and to these may be added strict entail, which fetters both the landlord and the tenant. (New Statist. Acc., p. 92.) Enclosures and plantations are on the increase, and improvements in agriculture meet with ready adoption. The buildings on some of the farms of any importance have been entirely renovated within the last thirty years. The black-faced sheep were exclusively reared till the commencement of the present century. Since then the Cheviot breed has been introduced, and has increased so rapidly, that even in the county the Cheviots now exceed the Shropshires of the other kind. The practice of smearing the sheep with grease is still general; but instead of tar, which was formerly employed, trun or cocoa-nut oil is usually substituted. It prevents the ticks, and is supposed also to increase the quality of the wool.

The arable farms vary in extent from 40 to 200 acres; the sheep farms from 600 to 4000 acres. (Findlater, p. 31.) The total number of sheep in the county in 1834 was estimated at 102,060.

The county is divided into sixteen parishes, the aggregate population of which, in 1831, was 10,578 persons. These were distributed among 2972 families, of whom 738 were employed in agriculture, 656 in trade, manufacture, and domestic service; 1212 were the hiring of others; and 377 were of those two classes. The inhabitants generally are now said to be distinguished for neatness and cleanliness, both in their houses and persons, though formerly it was far otherwise.

From the summary of the returns relative to the schools of education in 1834, printed by order of the House of Commons in 1837, it appears that, allowing for defective returns, the number of children in the county under five years of age who had been already taught or were then learning to read at school was 596, and in fifteen years already taught or then learning to read, the number was 1848, or rather less than two-thirds of the total number of children between those ages; and of those between five and fifteen already taught or then learning to write, the number was 1102. There were in all sixteen parochial schools, conducted by 17 instructors. The greatest number attending these schools during the half-year ending Lady-day, 1834, was 467 boys and 391 girls; and the least number during the same period was 305 boys and 239 girls. The aggregate receipts of the parish schoolmasters in the year ending with Lady-day, 1834, amounted to £632 8s. 6d. and to £77 12s. 6d. for parochial and salaries, 494£. 3s. 10d.; school-fees, 290£. 17s. 3d.; other contributions £30. There were also 14 non-parochial schools, conducted by 17 instructors, and attended by from 667 to 685 children.

The only antiquities of the county are the ruins of castles or towers, erected by the barons of the Tweed and its tributaries to frustrate the inroads of the English. The walls were of whinstone, strongly cemented, and varied from eight to eleven feet in thickness. One of these, the castle of Noedpath, now the property of the Duke of Buccleuch, was said to have been built by Sir John de Galfrid and Cromwell made a very stout resistance against the forces of the latter. Another, in the parish of Broughton, is called, for reasons unknown, the Castle of Macbeth.

Peebles, the county town, is agreeably situated on a valley on the northern or left bank of the Tweed, at the confluence of the Eddleston Water with that river. It is 20 miles due south from Edinburgh and 42 east by south from Glasgow. From the pleasantness of its situation and closeness to Edinburgh, it became at an early period the summer residence and place of resort of wealthy Scottish kings, and particularly of Alexander III., in the early part of the thirteenth century. This king is supposed to have been the founder of the cross-kirk, now a vaulted chapel, and of the Nichols burial-place of Scottish bishops who suffered martyrdom during the persecution of Maximianus (A.D. 300), and whose bones were believed to have been found upon the spot afterwards occupied by the church. To this church was attached a monastery of red friars, and it was the scene of the battle of Neville-cross (1346), in which David II. was taken prisoner by the English, the town of Peebles contributing largely towards his ransom, in consideration of which he, in 1367, created it a royal burgh. In virtue of this title it possessed the Privy Seal and other privileges. It was granted in union, in connection with the burghs of Lanark, Linlithgow, and Selkirk, down to the passing of the Reform Act, by which it was incorporated with that of Peebles, and a vote returned for two members. It is situated on a rising ground commanding a view of the Tweed, consisting chiefly of rents, amounts to about £643 annually. The annual expenditure is something less. There is however a debt, which in 1833 amounted to £5426. A provost, two bailifs, dean of guild, treasurer, and twelve councillors constitute the municipal corporation. A substantial stone building, was erected in 1784. St. Andrew's Cathedral, which was formerly used as the parish church, but which only a small portion is now standing, is a very elegant building, dedicated by Joceline, bishop of Glasgow, who died in 1199. It was converted into a stable by Cromwell's soldiers, by whom also the roof was demolished.

The bridge, which here crosses the Tweed, consists of five stone arches in the channel of the river, and three smaller arches on dry ground, for carrying off the water when the river overflows its banks. Till 1834 its width did not exceed 74 feet. Since then it has been widened to 22 feet, at an expense of £10,000. Four fairs are annually held in the town, one on the first Sunday of November. The population of the parish and burgh of Peebles, in 1831, was 2735. (New Statistical Account of Scotland; Findlater's Account of the Agriculture of Peeblesshire, 4to, Edinb., 1802; Pennycuick's Description of Tredreld, 4to, Edinb., 1715; Grove's Antiquities of Scotland, 4to, London, 1791; Forsyth's Beauties of Scotland; Parliamentary Papers, &c.)

PEEL; [MAN, ISLE OF]

PEERS OF THE REALM are persons in whom inhere certain high dignities with privileges appurtenant. Without meaning to decide the question whether the lords spiritual are in strictness of speech peers of the realm, the persons who fall under this description are the dukes, marquesses, earls, viscounts, and barons, and this without reference to the accident of age, an earl being as much a peer as

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peer of the realm, though a minor, and consequently not admissible to some of the high privileges of his order. Ladies may also in certain cases be peersesses of the realm in their own right, as by creation, or as inheritors of baronies which descend to heirs general. The wives of peers are possessors of that estate and entitled, in consequence of the rank, to certain privileges.

Under the several articles Duke, Marquis, Earl, Viscount, and especially Baron, will be found certain observations pertaining to each distinct order of peers. On the remote origin and eminence of persons, and on their dignities derived from it, especially that great privilege of having a house, in which, in conformance with the spiritual lords, they consider every proposal for any change in the laws and customs of the realm, and have an affirmative or a negative voice respecting it, and of being also the supreme court of judgment before whom appeal may be made from the judgment of nearly all inferior courts, great obscurity rests; as it does also on the whole of the early constitution and history of Parliament, of which the peers form so eminent a part. [Parliamentary Reports of the committee of the house of peers, which sat during several parliaments about the years 1817, 1818, and 1819, on the dignity of a peer of the realm, contain a great amount of information on these topics, but leave undecided some of the greater and most important questions connected with it.]

It seems however now to be clearly established, as a part of the laws and constitution of the realm, that every peer, being of full age and of sound mind, is entitled to take his seat in the house of peers, and to share in all the deliberations and transactions of that assembly. He is accompanied, besides, by others which illustrate the great consequence and deference which the constitution of England allows to the possessors of this dignity. If charged with any crime, they shall not be subject to the ordinary tribunals, but their guilt or innocence shall be examined by them. If they should be convicted, they shall not be arrested in civil cases; a peer's affirmation on honour is sometimes accepted where in ordinary cases an oath is required; and scandal concerning them are particularly punished.

It is now also clearly established that the crown may at its pleasure create a peer, that is, advance any person to the dignity, and to any one of the five orders; but that when once advanced the peer cannot be deprived of the dignity or any of the privileges connected with it, except on forfeiture of the peerage or on conviction of treason. The crown must descend, on his death, to others (as long as there are persons within the limitation of the grant), with all the privileges appertaining to it, usually to the eldest son, and the eldest male heir of the body in person, keeping to the eldest male representative of the original grantee. Some deviation from this rule of descent however has occasionally occurred, special clauses having being introduced into the patent, which is the writing by which the crown declares its will in this particular, limiting the descent of the dignity in a particular way, as in the case of the creation of Edward Seymour to the dukedom of Somerset, in the reign of Edward VI., when it was declared that the issue of the second marriage of the duke should succeed him to the dignity. But generally, and perhaps universally for the two last centuries, the descent of a dignity (cases of baronies in fee, as they are called, being now for a moment excluded) has been to the next male heir of the blood of the person originally ennobled; and not occasionally to the next, remoter representative, the heir of his father or grandfather. There is an instance in the reign of Charles I. of a dignity of peer of the realm being granted to a person (a Lucas) and the heirs of the Lucas's body, with remainder to all their male heirs, and then to the next male heir of the body, with remainder to all who should be the legitimate issue of the father and grandfather of the Lucas. It is not surprising that variety should be found in the manner in which the crown has declared its intention, and precedent should be producible for deviations from the usual course. The point is of some importance, since the question is from time to time raised, whether it might not be expedient that the ranks of the house of peers should be replenished by persons who are created peers for their lives only.

It has not unfrequently happened that the crown has granted the dignity of the peerage to a person, with remainder to the female issue of the grantee and his heirs, as in the case of the Nelson peerage. In these cases it has generally happened either that the party had no male issue to inherit, and that the other males of the family were also without male issue, or that the remainder being dignity inheritable by the male heirs of the party on whom a new dignity was conferred descended to his female issue.

The peers who possess what are called baronies in fee are the descendants and representatives of certain old families for the most part long ago extinct in the male line, which had in their day summoned to parliament as peers and whose dignity it has been assumed descended like a tenement to a daughter, if only one daughter and her heirs, or to a number of daughters as coheirs, when there was no son. This principle has been so often reversed that it may be regarded as a part of the constitution of the peerage, and in virtue of it, if A, die seised of a barony in fee, leaving B. a daughter and only child and M. a brother, the dignity shall inhere in B. in preference to M. and shall descend on the death of the eldest son. In case A., instead of leaving B. only child, leaving several daughters, B., C., D., &c., and no son, the dignity shall not go to M., but among the daughters; and since it is in principle, it is in the eldest female issue from more than one of these that he is supposed to descend. But should those daughters die with only one of them having left issue, and that issue a son, he shall inherit on the death of his aunts. This is what is meant by the dignity of a peer passing to the eldest of the female line, and not to the male line, as it stands among other persons, not one of whom possessing it wholly, none of them can therefore enjoy it. [Parceners.] But the crown possesses the power of determining the abeyance, that is, it may declare its pleasure that some one of the daughters, or some one of the eldest female issue of the family, shall possess the dignity, as would have been the case had there been a single daughter only; and in case of her thus entering into possession of the dignity, she shall take that precedence among the barons in the house of peers which belonged to the last peer to be the representative. A female who is only a coheir of a coheir may also have the abeyance determined in her favour, as was lately the case with Mrs. Russell, now baroness Dr. Clifford. It is out of this privilege of the crown that the peculiar dignity of a viscount descending to females is derived. It is not possible to give a complete catalogue of the house of lords in almost every session of parliament. A party sees reason to think that the crown may be induced to determine a certain abeyance in his favour, if he can by his own 秩manship of the representation of one of the heirs. This proof, which is necessary in a precise process, insomuch as it may be necessary to go back into the fourteenth or fifteenth century, is to be made to the satisfaction of a committee of privileges of the house of peers, and on the report of such committee that the claimant has shown himself in a satisfactory manner to be the proper representative of the blood of one of the coheirs of these right antiquated baronies, the crown has of late years often yielded to the reasonable request. In fact, without this, a cause of paramount importance, if often descended to female heirs, it would be difficult to maintain a really satissied nobility.

Many of the peers who belong to the higher orders of nobility have baronies in fee inherent in them; so that a barony is often a sort of perquisite of the dukedom of a child, and a brother, the brother shall take the superior title, and the barony descend to the daughter and the heir of her body. An eldest son of a peer enjoying a barony and a superior dignity is sometimes called to the house of lords, as the son of the father of a barony. He was entitled to a writ of summons without a patent of creation (it not being in fact a creation of a new dignity, but only in anticipation of the son's possession of it), and this is the case also when a barony is the issue out of abeyance.

Thus the English portion of the house of peers, or house of lords, for they are terms used in precisely the same sense are the lords spiritual, that is, the archbishops and bishops, and the lords temporal, who are of one of the five orders (though many of the dukes possess dignities of the first...
inferior kinds also, and their ancestors may have long had seats in that house in those inferior dignities before the family was raised to the dukedom), and these are either persons who have been created peers by the crown, who have been admitted into the peerage by favour of the crown in virtue of the donation of an abeyant or heir-presumptive dignity to some ancestor of the family, or who have inherited the dignity from some ancestor on whom it had been conferred.

The fullest information on all points connected with the archaeological past of this subject is to be obtained from the Reports of the Committee of the House of Lords before referred to. Biographical accounts of the more eminent of the persons who have possessed these dignities are to be found in that invaluable book, Dugdale’s “Baronage of England.” In 1766, Arthur Collins, a London bookseller, published in a single volume an account of the peerage that was the existing existence of their ancestors, a work of great merit. The demand for it appears to have been great, as it was followed by other editions in quick succession. It assumed a higher character in 1734, when it appeared in four handsome octavo volumes, greatly enlarged and improved and made to every article. From that time there has been a succession of editions, each professing to be improvements on the preceding, and each bringing up the state of the peerage to the time when the work was printed. The best of these, which is in nine bulky octavo volumes and was published under the patronage of Sir Egerton Brydges. But as titles become extinct, and consequently the families bearing them are left out of the peerage-books, those who wish to possess a complete account of those eminent persons must procure many of the earlier editions of the work as well as that which, by being the latest, will for the most part be called the best. There are certain minor works giving the geological details of the descent of the dignities, which are published almost every year.

PEEWIT. [Plovis.]

PEGANUM, from Peganon, the Greek name of Rue, of which three kinds are described by Dioscorides, the garden, the mountain, and the wild. The last is said to be called moly in Gallipoli and Galatia, and by some Aristocles, a remarkable tree that even in the present day a plant is found in the north of India, the Punjab, and Caubul, which is called hoornmil by the natives of the above countries, and sometimes distinguished in India by the name of Laboeoes hoornmil, indicating that it was introduced from the direction of Lahore. The Persian works on materia medica in use in India give mallee as its Greek name, according to Dr. Roylo (Illustr., p. 153). It is interesting to find that the plant to which these names are assigned by the natives of the country, is the Peganum Harmala of botanists, a fact which shows that the investigations of the West had arrived at the same conclusion as those in the East respecting the plant alluded to by Grecian authors; and this enables us to put more faith in the results of such investigations than is sometimes the case. The species of Peganum is called Strychnum, and belongs to the natural family of Rautemil, and is of easy culture in any light soil. The seeds which were formerly in use in medicine in Europe still are so in the East, but are not possessed of any peculiar or very active properties.

PEGASIA. [Pulmograpa.]

PEGASUS, one of the old constellations, called by Aratus (and also by Hyginus) simply the Horse. The mythological accounts of Pegasus as a son, it is supposed, of Nepthese and the Gorgon Medusa, though how with such parentage he came to be a horse is not stated), the creator of the fountain Hippocrene at one kick, are more than usually unconnected, and the constellation is not a whole horse, but only the head, fore legs, and tail, or to which a pair of wings is attached; nor is there any fountain near the place, except that with which Aquarius feeds one of the fishes. The figure of Pegasus is inverted, the head being farther from the north pole than the body; the constellation is surrounded by Cygnus, Crater, Aquila, Pegasus, and Andromeda. There are three bright stars, α (or Mekab), β (or Scheat), γ (or Algenib), which form a rectangular figure with α Andromedae, such as cannot be mistaken when the latter constellation is known. Moreover, a line drawn through α and β points to the pole star, in a line which produced passes through the points of the Great Bear.

The following are the principal stars:

PEGU was a century ago a powerful empire in the peninsula without the Ganges. The nation which established this empire is called Peguans by the Europeans, and Talam by the Birmans; but they call themselves Moan. They inhabit the low country which extends on both sides of the river Irrawaddy, from its mouth to the Galladest Mountains (from 18° to 18° 36' N. lat.), and from the banks of the Saluen river to the mountains of Aracan. Having attained a higher degree of civilization than most of the neighbouring nations, they extended their conquests northward along the banks of the Irrawaddy, and subjected the Birmans; but this numerous and warlike people rose against them and overthrew their empire. Their capital, Pegu, was taken by Alompra in 1577, every private dwelling was razed to the ground, and all the inhabitants dispersed or led into captivity. The successors of Alompra however built a new town on the same spot, which was visited in 1796 by Colonel Symes. The extent of the ancient town was accurately traced by Colonel Symes by the ruins of the ditches and the surrounding wall. It appeared to have been a quadrangle, each side measured about a mile, and a little new town occupied about one half of the area of the old town, and was fenced round by a stockade from 10 to 12 feet high; on the north and east sides it bordered on the old wall. There was then only one main street running east and west, crossed at right angles by two smaller streets. The streets were spacious and well paved with bricks, which the ruins of the old town plentifully supplied. On each side of the streets was a drain to carry off the water. The houses, according to the custom throughout the Birman empire, are

* This star is also marked 27 Aquarii.
raised either on wooden posts or bamboos of different heights, according to the size of the building. The kiousa, or monasteries, and the habitations of the higher ranks, are usually elevated six or seven and those of the lower classes from two to three feet. They are composed wholly of bamboos and mats, or thatching boards, and indifferently thatched. No brick buildings are permitted to be erected, except those which belong to the king or are dedicated to Gaudama. It is evident that in these places were allowed to build brick houses, they might erect brick fortifications, and thus endanger the security of the state.

The numerous temples were spared when Alomops destroyed the town. The most famous is the Shio Madou (Ch. Golden Dwelling of the God), which is 361 feet high and consists of two terraces and a steeple. The lower and greatest terrace is about 10 feet above the natural level of the ground, and forms an exact parallelogram. The upper or lesser terrace is similar in shape, and rises about 20 feet above the lower terrace. Each side of the lower terrace is 1391 feet, and of the upper 684 feet. The terraces are ascended by flights of stone steps, and on their sides are the dwellings of the rhabaana, or priests, made of boards and covered with tiles. The steeple, which is properly called the pyramid bell tower, is of the type to be god be god and mortal, without excavation or aperture of any kind. It is octagonal at the base and spiral at the top. Each side of the base measures 163 feet. This immense breadth diminishes abruptly, and the whole building may be compared in other respects. A strange variety of mouldings and ornaments in stucco encircle the building on all sides, and the whole is crowned by a bell, or umbrella of open iron-work, from which rises a rod with a gilded pennon. The upper part of the temple rises 31 feet, lowest to the lower rim of it are hung a number of bells, which, when agitated by the wind, make a continual jingling. The tee is gilt. All the lesser pagodas of the town are ornamented with umbrellas of similar workmanship, which are likewise occupied by small bells.

The priests inhabit groves, in which they build their kiousa, or monasteries, and instruct the boys in reading, writing, and moral and religious duties, without receiving any remuneration, except some rice or other necessaries. This is probably a consequence of their being but ten days durst at the temple, the silk and cotton cloth, which the women weave with considerableness still; but no more is made than is sufficient for home consumption.

This town, which is called Bagó by the natives, is situated about 19° 40' N. lat. and near 56° E. long., and is built on the eastern banks of a navigable river, which, about 90 miles below the town, joins the eastern or Syrian branch of the Irrawaddy about 3 miles below the town of Nyaung Oo, which seems to be the Pegu river to the town, but at the time of Symes's visit it had no commerce.

(Symes's Account of an Embassy to the Kingdom of Ava.)

PRIN FEORTE ET DURE. The 'strong and hard pain,' which is denoted by these words, was a species of torture used by the English law to compel persons to plead when charged judicially with crimes less than treason, but amounting to felony. It was applicable whenever the accused stood mute on his arraignment, either by his refusal to put himself upon the ordinary trial by jury, or to answer at all, or by his peremptorily challenging more than twenty jurors, which was a continuaency existing in some parts of the country, and shall not be standing more. This practice differed essentially from the 'quasimo' in the Roman law, and the torture which generally prevailed in Europe, and which, as connected with the royal prerogative, was also practised in England for several centuries. The object of the punishment was submission to the regular mode of trial prescribed by the law, and not to compel testimony or the confession of a crime.

Much difference of opinion has existed upon the question whether the practice of the praeire forte et dure originated with the statute usually called the Statute of Westminster I (3 Edw. I., c. 12), or whether it was in use at an earlier period. The latter opinion is maintained by Coke and Hale, but the former is adopted by Staunforde, Blackstone, and Barrington. In a note to Hale's Pleas of the Crown, vol. ii, p. 429, Emlyn says that although the Statute of Westminster I speaks of this punishment rather as a thing already known as a new introduction, there is no notice taken of it in any antient author, book-case, or record before the reign of Edward I.; and, on the contrary, he cites two curious records in the reign of Henry III. from which it appears that persons at that time were subject to the felony, and standing mute, were not put to the praeire forte et dure, but had judgment to be hanged. Upon this point it is worthy of remark that the statute of Edward I. meritoriously speaking, lays down in no especial form the prescription of inquests of felonies at the suit of the king shall be put to a hard and strong prison (sentent mya en la prison forte et dure), as those which refuse to be at the common law of the land; whereas the judgment of the praeire forte et dure is often given in a royal or even in a personal act of the king, proceeding to be imposed on the contumacious prisoner, not mentioned in the statute. Fleta, who must have written about ten years after the date of the statute, describes the judgment to be, that the party shall be cast into prison and lie upon the hard ground and ordered for barefooted; that he shall have for his food only three morsels of barley-bread in two days; that he shall not be fed every day, but only on alternate days; that he shall not drink every day, but that on the day when he shall have to drink he shall be given the wine in a cup or in a bowl, as appears from cap. 34.) It certainly seems improbable that all these circumstances should, within a very few years, have been added to the judgment warranted by the statute, of the Orson had really been the origin of the practice. Mr. Rees has plausibly suggested that the statute was applied to the practice of inquiry, namely, the duel, the ordeal, or the law. (History of the English Law, vol. ii, p. 137.) The trial by jury had no doubt been much encouraged, for the reign of Henry III., in opposition to the barbarous custom of ordeal, and was therefore in the manner improbable that this statute should have supplanted the promotion of this great judicial improvement. The language of the enactment also is entirely consistent with the view of its object suggested by Mr. Rees. On the other hand it may be, as Mr. Rees says, above mentioned, as cited by Emlyn, and the total silence of Gianville and Bracton, as well as of the judicial records anterior to the statute respecting such a mode of enforcing submission to the law, are adverse to this interpretation. The case of the rude proceeding must therefore be considered as uncertain.

It appears from Fleta, and also from Britton (cap. 21), that the punishment in the reign of Edward I. when the first traces of it in the history of English law appear, amounted to severe imprisonment only. The punishment was severe enough to prevent swarvation, until the offender repented of his contumacy and consented to put himself upon his trial. A curious charter of pardon in the 31st Edw. I. (1347), published in Symes's Padrere, vol. ii, p. 13, recites that a woman indicted for treason by her husband, having stood mute, had been adjudged ad passum suam, ut dicitur in quod sine cibo et potu in arte paschalis perfuga in manum decem vitam sustinet vitam, et quas contra naturam humanam. It appears therefore that at that time the sentence continued to be imposed, and did not authorize the infliction of any further violence. Shorter afterwards however the practice of loading the suffrages upon the weights and pressing him to death appears to have been forbidden by the statute of Westminster II (1406), the judgment upon persons standing mute, as approved by advice of all the judges, was that the woman should put them in low and dark chambers, naked except about their waist; that he should place upon them as much weight as they could bear, but that they should be unable to rise; that they should have no food or drink except running water; that the day on which they had been put to the punishment should have no legal effect; that they should lie there till they were dead. Thus, although the reporter states in this case that the judgment was formerly different, the punishment now became capital, a lingering and painful death being enjoined instead of severe imprisonment to extort submission. There is no trace of
any statute or royal ordinance, or of any authority besides that of resolution to justify a change in the mode of proceeding so as to render the life of the party absolutely
by which it was denoted was also changed from prisone
to prisone fort et dure; and from this period, for more than
thus centuries, until it was virtually abolished by the stat.

The surviving term (1757), pression, to death continued to be the regular and lawful mode of execution for crime who stood willfully mute upon their arraignment for felony. The press-yard at Newgate at the present day retains its name as derived from this barbarous practice.

Blackstone has doubts that were conceived of its legality, and the repugnance of its theory to the humanity of the laws of England; states that the peine fort et dure was rarely carried into practice. (Commentaries, vol. iv., p. 328.) It is probable that it was not of frequent occurrence, because with this fearful punishment for contumacy before their eyes, men would naturally for the most part (as Hale says) 'bethein themselves and plead.' It is however repeatedly mentioned in the Year Books as an existing proceeding; it is stated as the law of the land by Story, Coke, Hale, jet, and in their several treatises on the Criminal Law, and the number of the recorded instances in which it is directly or incidentally mentioned seem to show that it was much more prevalent than has been commonly supposed. The motive of the prisoner in standing mute can only be supposed to have been to save his own life, and prevent the corruption of his blood and consequent forfeiture of his lands in case he was attainted of felony. In the 21st of Henry VI. (1442), Juan de Salamanca, who was fined for high treason in speaking contemptuous words of the king is mentioned; another instance, in 1560, was that of John Russe before Lord Chief Justice Glynne, and, as far as it is known, he was allowed to plead, was pressed to death in Newgate. In the pamphlet which minutely narrates the particulars of this execution, he is described as 'a man of great marks,' and many people in the press-yard humbly casting stones upon him to hasten his death. (Barrington's Antient Statutes, p. 83, note.) In still more recent times it appears from the Old Bailey Sessions Papers that at the January Sessions in 1720, one Phillipis was pressed for a considerable time, until he begged to stand his trial; and at the December Sessions, 1721, Nathanael Haws continued under the press with 250lbs., for seven minutes, and was released upon his submission. Mr. Barrington says that this man had been furnished with two inside cramps, one for each of his arms, and was kept at the Sussex assizes before Baron Thompson, and the other at Cambridge, in 1741, when Mr. Baron Carter was the judge. (Barrington's Antient Statutes, p. 86.) In these instances, it is clear the term was inflicted until by a majority of the judges the experiment of a minor punishment had been tried by tying the culprit's thumbs tightly together with strings. It is said in Kelyng's Report, p. 27, to have been the constant practice at Newgate in the reign of Charles II. that the two thumbs should be tied together with a whipcord, that the pain of that might compel the culprit to plead. The adoption of this course was no doubt dictated by merciful motives, and was intended by the judges to prevent the necessity of having recourse to the peine forte et dure. This practice was finally discontinued in consequence of the statute 12 Geo. III., cap. 20, which provides that every person who shall stand mute when arraigned for felony or piracy shall be convicted of the same, and the same judgment and execution shall be pronounced on him as if he had been convicted by verdict or confession.

PEIPUS, Lake. [Russia.]

[PIERESC, NICOLAS CLAUDE FABRI DE, a council
tor of the parliament of Aix, was born at Beauphant, in Presby, and died in 1697. His father, Guillaume de Fabrique, was a councillor of the court of sides. He received his earliest education among the Jesuits at Avignon, whence he was removed to Aix in 1695. It was during this period that his father being presented the emolument of a vicar of Arcadenz at this city, young Pieries begge to have it; and being delighted at finding that he could decipher the inscriptions, carried it to his uncle, who gave him two more, together with some books upon medals. This incident led him to the study of antiquities, in which he afterwards distinguished himself.

In 1635 he visited Italy, and the various cities and countries of which he spent nearly three years. In 1604 he took the degree of doctor in law at Aix. In 1605 he accompanied Duvair, the first president of the parliament of Aix, to Paris, where he formed an acquaintance with Tho, Jean Cassou, Pierre Masseau, Nicolas le Fauvel, the brothers St. Mari, Bongars, and Francis Pithee. In the following year came in the suite of La Boderie, the French ambassador, to England, where he was graciously received by King James. He visited Oxford; and formed an intimacy with John, Sir Robert Sollivoe, and other learned men. From England he passed over to Holland, and through Antwerp and Brussels back to Paris.

In 1618 he procured a faithful copy and published a second edition of the 'The Acts of the Monastery of Marem in Switzerland,' in defence of the royal line of France against the title of succession of the Austrian family to the French crown.

Pieries was a liberal patron of letters; Bayle gave him the title of 'le procureur general de la litterature;' and the authors of his life show how imperfect the labours of Scaliger, Holstenius, Sauviasse, Sicard, and Kircher would have been, unaided by the literary treasures which he procured for and presented to them. He was at his instruction that Grotius undertook his great work 'De Jure Belli et Pacis.'

The multiplicity of his engagements and the extent of his correspondence prevented Pieries from finishing any considerable work. A number of manuscripts, antiques and modern, on local history and antiquities, mathematics, astronomy, the medallio science, languages, &c. A catalogue of his manuscripts more than seven hundred, is preserved among Sir Hans Sloane's Manuscripts in the British Museum, No. 767.

Of his writings there have been published forty-eight Italian letters addressed to Paul and John Baptist Guido, published in 1679 under the title 'Letters,' of which many are among those of Camden published by Smith; and a long and learned dissertation on an ancient tripod found at Frejus in the Memoires de Litterature et de L'Histoire, by Desmarteau, in 1731. A considerable number of Pieries's dedicatory letters were of late years communicated from time to time to M. Millin for his Magasin Encyclopedique, by the president Fauris de Sant Vincens, who again published them separately, in five different tracts or portions, 8vo., Paris, 1815.

Pieries died in the arms of his principal biographer. Gassendi, June 24th, 1637. He is stated to have purchased more printed books than any man of his time, yet the collection which he left was far from large. As fast as he purchased books and manuscripts, he sold them to the learned men, to whom he knew they would be useful. His remaining library was purchased by the Collage de Navarre.


PEKEA is the name given by botanists to a plant inhabiting Guiana, and furnishing the Sauari or Sawara nuts from which are made the calabash. The botanical name of Sauari is given in Guiana. This Pkea comprehends two species, the butyros and tuberculosa: the former is unknown in this country; the latter, which yields the fruit in question, is a very large tree inhabiting the woods of Guiana, where it is called Tawa-s, which is considered by the Indians. It has opposite digitate leaves, whose leaflets are oval, smooth on the upper side, but white with down beneath; the terminal leaflet is said to be inches long by inches broad; the flowers are small, white. The flowers are unknown. The fruit consists of greenish compressed drupes, which adhere around a common centre, and contain a single seed of large size, covered with a brownish rugged woody shell, and containing a kernel of a size and quality, the most desirable of the genus. It is by far the best of the South American nuts that are brought to England, and much superior to our own walnuts, almonds, and filberts; but it is scarce and dear in most seasons.
Peking, the capital of the Chinese empire, is situated near 40° N. lat. and between 116° and 117° E. long., in a level plain, which on the west of the town assumes an undulating surface, and at some distance from it rises into low hills. It is about 80 miles distant from the Great Wall.

The city consists of three parts: the Zen-teou, or City of the Throne; the Wailo-teou, or External town; and of twelve suburbs. The first is also called the Town of the Tartars, as the inhabitants are of Mongol or Manchou extraction; and the second, the Town of the Chinese, being entirely inhabited by Chinese. These two cities are enclosed by walls, the circumference of which is 58 li, or about 17 English miles. The suburbs extend on the east, south, and west of the walls. The walls are about 40 feet in height, and surmounted by a parapet deeply creviced, but without regular embrasures; the merlons contain hole-holes for archers. The thickness of the walls is about 20 feet at the base, and 12 across the terreplein upon which the parapet is erected. The outside of the walls, though not perfectly perpendicular, is smooth, but the inside has a considerable bevel, the rows of bricks which form it being placed like steps, one above and behind the other, like the steps on the faces of the Great Pyramid of Egypt. In some parts there are spires of earth, on which the cavalry can ascend the walls, on which several horsemen can ride abreast. The walls are flanked on the outside by square towers, at about sixty yards distance from each other, and projecting 40 or 50 feet from the curtain between them. Sixteen gates lead to the town. Over each gate is a watch-tower, nine stories high, and in each story are port-holes for cannon. The lowest story forms a large hall for the officers and soldiers on guard. Round the gate, on the outside, is a semicircular wall, enclosing a space about 360 feet long, which serves for a parade. In this semicircular wall there is a lateral gate, by which the troops can enter the parade without marching on the high road. A wall of less dimensions separates the Zen-teou from the Wailo-teou.

The roads leading to the city are paved with blocks of granite; the streets are not paved, but are constantly watered to keep down the dust. The principal streets vary from 140 to 200 feet in breadth, but they contain no large buildings; the houses are usually not higher than one story, and few have two stories. The streets are lined with a continuous series of shops, in which the goods are laid out with great order. The wooden columns in front of the shops are painted red, blue, and sometimes are gilt. In several places triumphal arches cross the streets. They are built of wood, and consist of three handsome gateways, of which the middle is the highest and largest, and over them the roofs are richly decorated. Public edifices and also the dwellings of private persons occur only in the narrow streets and lanes. Where these lanes open into the water streets there are generally gates, which are shut at night and opened only in case of need. The private dwellings do not embellish the town, as they are separated from the walls or curtains, to prevent passengers from seeing the court into which the street-door opens. They are built of bricks, and have a roof of grey tiles.

No navigable river flows near the city. A narrow canal, called Yung-ho (imperial canal), runs through the town, but the waters are only used to feed the canals and pools of the imperial palace. The inhabitants have wells, the water of which is however brackish, and wealthy persons possess water from wells without the town, especially from those on the north side, which are famous for their excellent water.

The buildings belonging to the emperor, as well as to the temples and altars, have roofs consisting of four slopes, but all the other buildings have only two slopes. The imperial buildings are covered with yellow tiles, those of the other with green tiles, and all the other houses with grey tiles. The temples not belonging to the emperor, and also the courts are mostly painted red. Peking contains a great number of temples and houses, decorated with numerous works of marble, but a considerable portion of the area of the town is occupied by squares, gardens, ponds, and even fields.

The Zen-teou, or City of the Throne, consists of these parts, enclosing one another. In the centre is the imperial palace, called Zen-zeou-teou, which has the form of an elongated rectangle, and is surrounded by a high wall, yellow, and hence called the Yellow Wall. It is about two miles and a half in circumference, and contains, in addition to several residences of the emperor, some public buildings and magazines, also extensive gardens, with canals, ponds, and forges, are planned and arranged. The Zen-zeou-teou is surrounded by the Kuan-teou, the Imperial Town, which is seven miles and a half in circumference, and contains, among other remarkable buildings, the temple of Po, or Shigemuni, with a statue of the god made of copper and gilt, which is more than 100 ft. high. In this part of the Zen-teou there is a square called Zin-shang, near which is a beautiful hill, called Zin. The Kuan-teou is enclosed on all sides by what is more especially called the City of the Throne, or Zen-zeou-teou, in which the annuities and the tributes of all the tributary nations are collected. The whole city is ten and one-sixth miles in length, and is nine and five-sixths in width. It is considered as a military encampment, and divided among the eight divisions of the Manchow troops, which are stationed there. This immense city does not contain a single building.

The Wailo-teou, or Town of the Chinese, is properly only a suburb, and has been enclosed with walls only on account of the two principal altars which it contains, and on which the emperor presents his offerings. These are the Tsien-tan, or Eminence of Heaven, which is round, and about two miles in circumference, and the Teo-tan, or temple dedicated to the earth, which is a square, because the patient Chinese considered the earth to be of a square form. Within the walls enclosing the second temple, and what is called a temple of about a mile in diameter on a large field on which the emperor himself every year goes to plough. In this part of Peking are the theatres, and other places of amusement, as baths, &c. It extends along the southern side of the Zen-teou, and is somewhat longer, but not so wide. It contains two Catholic convents and a mosque. In one of the suburbs east of the town is the convent of the Cho-shan se, in the stepe of which is a very large and weighing nearly 1400 cwt, which is heard in all parts of the town when it is rung.

The population of Peking was estimated by Staunton at three millions, but Peré Hyacinthe makes it only two millions. This cannot be considered as a great population when the immense extent of the Chinese empire and its wealth are considered. Staunton, in comparing Peking with the large towns of Europe, says, 'Peking is merely a part of the government of the empire,—it is not a port. It is not a place of inland trade or manufacture. No representatives
We read that Elizabeth’s studies in the Greek Fathers have alarm on this ground. Hooker asks—The heresy of free-will was a milestone about the Pelagians’ neck; shall we therefore give sentence of death inevitable against all those Fathers in the Greek Church who, being misrepresented, are in the error of free-will? Almost equivalent to this was the opinion of Jackson, Extremes, and tendencies to extremes, beget, as is well known, the opposite errors. It may accordingly be objected to the early Anglican writers, that the remembrance of the evil to which so much of human labour and toil have been adduced in ancient times, with the excess for which those who have. Except perhaps some of the relations of the emperor, few indeed are those whose only business is the pursuit of pleasure and the consumption of that time which others are under the necessity of employing in the performance of some public or private duty. Peking, being the seat of government, contains the great offices for the administration of the empire, which are situated, for the sake of convenience, near the southern gate of the imperial palace. The most remarkable of them is the office of Li-pou, has for its object the preservation of the customs of the empire. Some of the later mandarins have taken to investigate the effect of existing laws, the conduct of the other offices, of the princes and great officers of state, and even of the emperor himself. The garrison of the town is estimated at 60,000 men. Peking is the subject of the following passage in the "A Chronicle of a Embassy to the Emperor of China; and Description of Peking, traduite du Chinois en Russie par P. Hucqinthe, et du Russie par F. de Pigny, Petersburg, 1829.

PÉL. AUGUSTIN Pélauroux gives this name to a small comic from the Canton, ranked by Blainville among Millepourdes.

PÉLAGIUS. (Pulicopathic.)

PÉLAGIANISM. PELAGIUS, REMONSTRANTS, and CONFORMISTS. The disputes in the earlier centuries of the Christian church, when first liberated from external violence and obscurity by its formal establishment, related to the fundamental dogma of the Trinity. Christian writers, when freed from this struggle for life, and from the task of drawing up apologies in defence of the dignity, consistency, and purity of the faith which they professed, were occupied until the commencement of the fifth century with stating and enforcing the Catholic doctrine on this head. This task accomplished by the leaders of the Eastern church, and with respect to those dogmas (which seemed thus opened), a succession of controversies arose, of a blended dialectic and practical nature, and, for this reason, equally fitted to occupy the attention of the principal intellects of the West. Such were the questions respecting the nature and the effects of原罪. Whether the great Fathers of the church, anterior to the controversies of Augustine and Pelagian, had propounded sentiments which might be fairly considered as favourable to either party, is a doubtful question, and one, consequently, whether the sentiments of St. Augustine, identical with his own, will serve to illustrate this remark. St. Gregory of Nazianzum, according to the deliberate judgment of his biographer, was not so consistent as either Augustin or Pelagius. He appears to have held a mean between the doctrines of unqualified freedom, as laid down by Origen, and those of grace, as subsequently taught by Augustine. His theory, if carried out (for the gomms only of a theory are to be found in his writings), would have led him in all probability to return to the position of Pelagius rather than of Augustine. But precise dogmatic statements not being called for (as no theory on these subjects had been formally put forward), the sentiments of St. Gregory seem to have remained to the last an anticipation of what, in the days of the Reformation, would have been called Syncretism. This anticipated Pelagianism of the early fathers was laid to their charge by some doctors within the church of England, during the latter portion of the sixteenth century.
with those of the Eastern church, he retired to his native country. Very little of his writings has come down to us. 'The Pelagians,' writes Hooker, "being over-great friends unto nature, made themselves enemies unto grace, for all their confessions that men have not their souls, and all the faculties thereof, their wills and all the abilities thereof, from God." Pelagius himself, of a cold and passionless temperament, and removed from the bustle and vices of the world in the cloister of his brother monks, lived through the flower of St. Augustine. Although fully alive to the deadly evils of Antinomianism, he fell into an error equally pernicious, when he proposed to preach, as an antidote, the limitation of the sin of Adam (in its consequences) to himself, and to teach that "we do good, and so are pleasant and acceptable to God," so as to merit eternal happiness, without the aid of divine grace. Not merely the culminating points of the system of Augustinian, the doctrines of irresistible and absolute predestination, were repudiated by Pelagius, but the fundamental doctrines of the gospel, of the necessity of pardoning mercy and sanctifying grace, were degraded from their proper rank in the Christian scheme, and the Atonement deprived of its essential virtues. But Pelagius was better than his system; which, under different names, has been the favorite of those who have propounded the doctrine of the unmerited favor of God. It is the character of those by whom it was propounded, to palliate their mischievous mistakes.

Differing so widely as did the systems of Pelagius and its great antagonist, it was not difficult to foresee that attempts would be made to remodel the church of the south of Gaul at that time in a flourishing condition, its leaders pious and learned, and an active ecclesiastical spirit pervaded the whole body. The first attempt, a reaction against the preconceived dogmas of Paris and Marseille. Its supporters were consecutively designated as Semi-Pelagians. They agreed with St. Augustin, in that they ascribed (generally) a holy life as such to the grace of God; but on the other hand, they approached more nearly to Pelagius, than attributed the beginning and end of the commencement and sum of a course of acceptable actions to the force of human merit. Its internal character, as well as the circumstances under which it originated, contributed to give it some popularity, and to rank among its defenders the names of Cassian and the better known of Cyprianus. But the orthodox belief found active champions in Hilary and Prosper. To the exertions of the latter the formal document of Pope Cæcilius condemnatory of Pelagian doctrines is principally attributable.

Such was the state of the council of Orleans in 529, the system of Augustin may be considered as the established standard of orthodoxy throughout the West. But the seeds of future discussion were contained in the authorities of the council, which were variously couched in wide terms.

And the subject of predetermination was treated indirectly and in general expressions, with a view to avoid controversy. The doctrine of predetermination to consecration, it is to be observed, was expressly rejected; and the decrees of the council, the hope of perfect secures proved, as usual, the parent of weakness. Various attempts were made to turn the embarrassing doctrine of predetermination. The most popular among these is that which arose during the ninth century, with which the name of the unhappy Godeschalk is connected. The condemnation, disgrace, and punishment inflicted on this unhappy man, in consequence of his ultra-Augustinianism with regard to the doctrine of consecration, which brought upon him the ruin of the ruling Semi-Pelagian party, are well known. It is sufficient here to remark that the condemnation of Thomas Aquinas, pure and elevated, and so much of his teaching undoubtedly was, and Augustinian as he has often been deemed, are found, when closely regarded, to be at least Semi-Pelagian. Most close and natural was the connection between Pelagianism and the paramount attention bestowed by the heretics of S. Augustine, with whom the interests of religion were often sacrificed.

The naturalism of the system of Pelagius is well known. In this also some of the leading schoolmen were his followers. In their high and unbound admissaries for morality, in their systematics, and in their most eligible guide to Christian truth, they left, like Pelagius, the line of demarcation between Christianity and heathenism faint and indistinct.

The modern Arminians [Arminius; Dordt], called also the first imagination, the second imagination, and the third imagination, were made the consequences of justification and salvation, just as Adam's perfect obedience would have entitled him to eternal life; and so God renews this imperfect obedience for perfect, having relaxed the rigour of the law upon the persons and decisions of God, and made the free will of any particular being to save any particular person for it, but only to redeem all men in general, and now he applies salvation to all that believe and repent. 1. That Christ so far redeemed all men, that none are damned by nature, but that men are free to accept or reject salvation under the same conditions that he was under in the days of the apostles. 2. The doctrine of free will is necessary in order to save men from sin. 3. That God is not without any particular design to save any particular person, but that he is able and willing to save all. 4. That the doctrine of free will is almost as much as annihilate its effects. The doctrine of final perseverance they always reject.

Mention has already been made of the wicked and cruel persecutions to which the Arminian party was subjected in connection with the synod of Dort. It is beyond our present object to discuss the charge impounded to their principles, of leading to Socinianism. But the theological authors of that age are to be compared to Lemaire and Grotius. The latter, with all his obvious faults, for a long period was regarded as the chief of Protestant expositors.

Another and important question remains behind, as to whether the supposed sudden influx of Semi-Pelagians or Arminians into the church of England is not due to one of the early part of the seventeenth century in any way attributable to the disgust conceived towards the conists, Remonstrant or Calvinist party, the victors at Dort, and the supposed better accordance of Arminianism with the high principles then held in certain things; that, God was pleased without any particular design to save any particular person, but that he is able and willing to save all. 1. That Christ so far redeemed all men, that none are damned by nature, but that men are free to accept or reject salvation under the same conditions that he was under in the days of the apostles. 2. The doctrine of free will is necessary in order to save men from sin. 3. That God is not without any particular design to save any particular person, but that he is able and willing to save all. 4. That the doctrine of free will is almost as much as annihilate its effects. The doctrine of final perseverance they always reject.

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danger to his soul. Yet so still, that the glory of God's justice, mercy, truth, sincerity, and divine grace be not any ways blemished, nor any good ascribed to man's corrupt will nor any evil to the good; but the universal blessing of the whole world, following the name of the three chapters, being supported in his view of the question by the emperor Justinian, who was fond of interfering in theological disputations. (Norris, *Dissertatio de Symodo quinta.* Galpagus died in the year 566, and was succeeded by Juliana, who was a woman. (Peliaus II. 358.)

Pelaus I. succeeded Bezgous I., a.D. 358. He was likewise embroidered in disputes concerning the three chapters above mentioned. In the meantime a council which met at Constantinople consisted on the patriarch of that city, the title of *Theologian* or 'universal' bishop, at which Pelagius was greatly offended. He died at Rome, a.D. 590, and was succeeded by Gregory I.

Pelagus, De Monforte's name for a genus of *Ammonites*, whose sires are covered by the last whorl, and which have an umbilicus; *Orbicularis* of Lamarc and others.

Pelamys, Daunin's name for a genus of marine ophiurans [Echinus] found in the seas of warm climates. A specimen of *Pelamys bicolor* has been picked up dead on the coast of Italy, and a species of *Pelamys* has been introduced into the aquarium for the curiosity of those who are interested in marine animals. (Dr. Cantor, in *Observations on Marine Serpents,* enters into the distinguishing anatomical characters, habits, and general constitution of this group with reference to the element in which they exist. But little attention has hitherto been paid to the study of these animals, and the author has been enabled to show them alive, and also from their geographical position being entirely confined to the tropical seas. Dr. Cantor was stationed on the delta of the Ganges, and had, for a considerable period, every opportunity of studying these ophiurans, many of which were taken in the nets of the fisherman. The principal physiological point of interest established by the Doctor is the very venomous character of all the species without exception, a fact denied by Schlegel, who states that the ophiurans are not venomous. This is also a characteristic of the natives. Dr. Cantor gives fatal proof of this error in the death of an officer in Her Majesty's service not long ago, within an hour or two after the bite of a serpent which had been caught at sea; and from numerous experiments conducted by himself, the result of which was that frogs, fish, and other animals invariably died within a few minutes after the bite had been inflicted. (Zool. Proc., 1838.)

Pellarcornium is the name given by botanists to the genus which is usually called Geraniwm in our greenhouses. The latter differs obviously from Pelargonium in having regular flowers, and in being herbaceous plants, while the genus in question consists almost entirely of woody plants. The reason is this: Geraniums are referred to an entirely different order. There is a large number of genuine species of this genus, chiefly inhabiting the Cape of Good Hope; and as these intermix very readily, producing in great abundance shrubs which are capable of being perpetuated by cuttings, a prolixity of spurious species, as well as acknowledged varieties, have found their way into the writings of systematic botanists. For example, De Candolle enumerates 369 supposed species, of which at least one-half are of artificial origin. While however science has been embarrassed by the numerous Cotinarians and Pelargonium tribe, which are richly crowded with the most beautiful objects, in which the features of their savage progenitors can no longer be recognised; and it is probable that of all the flowers which have been acted upon by the hand of man, the Pelargonium is that which has been most strikingly altered. By care and attention to a few simple points of practice, these plants may be cultivated and multiplied by any one who has a greenhouse, and hence they have become universal from one end of the earth to another. Namely: 1. water, 2. warmth, 3. a gentle bottom heat, 4. abundance of air, 5. as much light as the leaves will bear, and 6. a rich soil during the season of growth; and a cool atmosphere, less water, abundance of light, and close pruning afterwards.

Pelagia (Πελαγε) were the most antient inhabitants of Greece, as far as the knowledge of the Greeks themselves extended. A dynasty of Pelagian chiefs existed in Greece before any other dynasty is mentioned in Greek traditions. Danan is in the ninth, Deucalion in the eighth, Glaucus in the seventh, and Cadmus in the sixth generation before the Trojan war; but Phoroneus the Pelasgian Athenian chief, descended from a generation before that epoch. The Greek traditions represent the Pelasgic race as spread most widely over almost all parts of Greece and the islands of the Greek archipelago. According to Strabo, the Pelasgi in the time of Herodes, Boottia, Bovisia, and Phocis. (Strabo, vii. 321; Herod., viii. 44.) The oracles of Delphi and Dodona were originally Pelasgic (Strabo, iv. 402; vii. 327; compare Herod., ii. 323; and Mr. Clinton (Hist. Hell., vol. i. p. 22) and Niebuhr (*Rom. Hist.,* vol. iv. p. 228).) Pelasgus informs us (vii. 95) that the islands were inhabited by the Pelasgic race till they were subdued by the Ionians. The neighbouring coast of Asia Minor was also inhabited in many parts by the Pelasgi. (Strabo, xii. 621.) The country afterwards called Libya was occupied by Pelasgus (Herod., viii. 42; and they were advanced in the time of Herodotus (vii. 42). Tralles in Caria was a Pelasgic town (Niebuhr, *Rom. Hist.,* vol. i, p. 33), and two of their towns on the Hellespont were still extant in the time of Herodotus (i. 57).

The preceding statements are sufficient to show the wide diffusion of the Pelasgic race; but it is a difficult matter to determine from what quarter they originally came. Many modern writers (Malden, *Hist. of Rome,* p. 69; Bishop Gough, *Rom. Hist.,* p. 402; and many others) connect the Pelasgian with the ancient name of the original seats of the human race, that the Pelasgians spread themselves from Asia into Europe, across the Hellespont, and round the northern shores of the *Aegaean* Sea. But this opinion, though it may be true, is opposed to many of the Greek traditions which represent the Pelasgennases as the original seat of the Pelasgians, whence they spread to Thessaly, and thence to the islands of the Greek archipelago and to the Asiatic coast.

Phoroneus, son of Inachus, king of Argos, is represented by most Greek traditions as the first king of the Pelasgians, and the early chronologers give a list of his successors at Argos. One of these kings, Pelasgus, was in the ninth or tenth generation from Phoroneus, is said to have founded Arcadia; and according to later traditions, the Pelasgians originated in Arcadia. (Paus., viii. 1, s. 2; Ephorus, *opud Strab.,* v. 221.) From the Argive Pelasgians the race spread to Asia and the other parts of Greece, but it is difficult to arrange the times of these early Pelasgians. (Gibbon, *Hist.,* vol. iv. p. 27.) One of the authors who places them in the following order:—1. A migration under a Pelasgic chief, represented by Xanthus, son of Triopas, planted a colony first in Lycia and afterwards in Lesbos. (Diod. v. 81.) 2. Two generations later a migration proceeded to Thessaly, represented by Achmus, Phthonus, and Pelagus, sons of Lyrissa.* 3. Nearl contemporary with this migration, and in the ninth generation from Phoroneus, a Pelasgic chief, probably derived from Argos, established himself in Arcadia. 4. Two generations later the Argives came to Arcadia. 5. The Pelasgians were widely spread over the south of Asia Minor, and the places in which they had been settled are indicated by Mr. Malden (*Rom. Hist.,* p. 72-63). There seems no reason for rejecting, as some modern writers have done, the account of Dionysius, that the Pelasgians emigrated from Thessaly into Greece.

In some parts of Greece the Pelasgians remained in possession of the country to the latest times. The Arcadians were always considered by the Greeks themselves as pure Pelasgians.

*[The name Phoroneus frequently occurs in Pelasgian legend. It was also a common name of the Pelasgians themselves, and was often applied to the first chief of Argos, which was called Lyrissa. (Paus., ii. 39, a. 9) and we also read of two Lyrissi in Thessaly, a Lyrissa near Troy, another near Cusa, another in the territory of Phocis, and one at Leotus, near Corinth, as well as many others. (Compare Strabo, iv. 406.) Vol. XVII.—3 C]


P. C. No. 1005.
Pelagia, and a Pelasgian dynasty reigned in Arcadia till the second Messenian war. (Herod. i. 146; ii. 171; viii. 73.) According to Herodotus (vii. 44; i. 57), the Athenians were a Pelasgian race, which had settled in Attica from the earliest times, and had undergone no change except by receiving a new name and adopting a new language. In most parts of Greece however the Pelasgian race became intermixed with the Hellenic, but the Pelasgi probably at all times formed a distinct political and religious nation of the population of Greece. The Hellenes expelled the Pelasgi in military prowess and a spirit of enterprise, and were thus enabled in some cases to expel the Pelasgi from the country, though the Hellenes generally settled among the Pelasgi as a conqueror among the conquered. The connection between the Pelasgic and Hellenic races has been a subject of much controversy among modern writers. Many critics have maintained that they belonged to entirely different races, and some have been disposed to attribute to the Pelasgians an Asian or Semitic origin. It is true that many of the Greek writers speak of the Pelasgi and their language as barbarous, that is, not Hellenic; and Herodotus i. 57 informs us that the Pelasgic language was spoken in his time at Placira and Syclis. This language was therefore barbarous; and on this fact he mainly grounds his general argument as to the ancient Pelasgic tongue. It may however be remarked, that it appears exceedingly improbable, if the Pelasgic language had been a distinct tongue or a very slight relation to each other, that the two languages should have been so readily amalgamated in all parts of Greece, and still more strange that the Athenians and Arcadians, who are admitted to have been of pure Pelasgic origin, should have had a language so far removed from the Greek as to be little known in the Archaic period. In addition to which it may be added, that we scarcely ever read of any nation entirely losing its own language and adopting that of its conquerors. Though the Persians have adopted many new words into their language from their Arab masters, yet they have not lost their own language, and the Persians have never become a nation with Persian origin. It is therefore reasonable to suppose that the Pelasgic and Hellenic tongues were different dialects of a common language, which formed by their union the Greek language of later times.

The antient writers differ as much respecting the degree of civilization which the Pelasgic attained before they became an Hellenic people, as they do respecting their original language. Some of the ancient writers were led to believe that they were little better than a race of savages till conquered and civilized by the Hellenes; but others represent them, and perhaps more correctly, as having attained a considerable degree of civilization previous to the Hellenic conquest. Many traces of the art of the Tusans and the cultivation of the useful arts; and a modern writer (Thirwall's Greece, vol. i. p. 59) rather fancifully supposes that the most antient form of their name (Παλαγείς) signified inhabitants or cultivators of the plain. It is a curious fact, which has been noticed by Mr. Malden, in his 'History of Rome' (p. 70), that the Grecian race which made the most early and most rapid progress in civilization and intellectual attainments, was one in which the Pelasgic blood was mingled with that of another race, by foreign mixture—the Ionians of Attica and the settlements of the mainland, which were governed by a common tradition, and perhaps owe to the Pelasgic element in the population of Greece all that distinguishes the Greeks in the history of the human mind. The Dorians, who were the most strictly Hellenic, long disdained to apply themselves to literature or the fine arts.

Some writers have maintained that the Greeks derived the art of writing and most of their religious rites from the Pelasgians; but without entering into these questions, it may be asserted with considerable degree of confidence, that the most antient architectural monuments in Europe clearly show that the Pelasgians have been the works of their hands. The structures in Greece, Italy, and the western coast of Asia Minor, usually called Cyclonian, because, according to the Greek legends, the Cyclopes, in the poem of the Odyssey, were the builders of them, may properly be assigned to a Pelasgic origin. All the characters are characterized by the immense size of the stones with which they are built; the most extraordinary of them all is the treasury or tomb of Atreus at Mycenae, of which an account is given under MYCENAE.

(Marsh's Horae Pelagiae, 1838, and Babelon's Histoire de Rome, vol. i. p. 32-63; Malden's History of Greece, vol. i. p. 39-62; Clinton's Fasti He- lenici, vol. i. p. 1-30; Wachsmuth's Hellensthische Alterthumskunde, vol. i., part i., s. 9; Curtius, De Antiquis Ita- lica, lib. viii., ch. i., s. 8; Smith, Histoire de l'Art, vol. i., ch. ii. The following are recommendations of the Pelasgian.

PELASGIAN ARCHITECTURE. [Palaqy.] PELAYO, first king of Asturias, was the son of Pero, duke of Cantabria, and a descendant of Chindaiond, the twenty-eighth in order among the Gothic kings of Spain. He was a hero of the second battle of Poitiers and an invader of the Christian lands, who either feared the energies of the Moors or conquerors or could not bear their yoke, fled for refuge to the inaccessible mountains of the Asturias, where the arms of the invaders had not yet reached. Among them was found an old man, who, having bravely on the plains of Xerez, and witnessed the defeat of the Christian armies, but who, if we follow the account of the Arabic writers, escaped from Cordova, where he was retained as a hostage for the fidelity of his countrymen. On his arrival there he was received with delight by the refugees of Cordova. At first these relics of the Gothic monarchy seem only to have been animated by the wish of self-preservation, but on their numbers increasing, they thought of re- viving the expiring embers of liberty. Al-horr le Abad-el- omron, who was governor of Cordova, having been apprised of their intentions, despatched a consid- erable force under Alkama, to crush the rising insurrec- tion, but the followers of Pelayo had already gained posses- sion of the mountain pass of Ausena, near the river Miel, and, having obtained success on one part of their field of battle, threw their ranks into confusion. Pelayo and his followers then issued from the cavern, and the Moors fled precipitately from the field of battle, leaving their general and their principal officer to the mercy of their enemies.

Pelayo's success did not end here. Munuza, or Al-ma- nayzar, the governor, some say, of Leon, others, of Opon, who hastened to the assistance of his countrymen, but lost his life in a like manner, and his army was completely defeated. Some memorable events fixed the boundaries of the Asturian kingdom. The important city of Leon, long the court of Pelayo's successors, was next reduced (722), as well as Zamora, Lugo, and Astorga, and although the Mohammedans in 724 recovered some of these places, the intestine war in which the Asturians themselves were engaged, and the con- cussions of Pelayo, helped to consolidate the little kingdom which the Asturian hero transmitted to his successor Alonso el Casto. The remainder of Pelayo's reign is un- known. He died in 737, and was buried in the church of the Caves de Oca, whose old name is preserved in the name of the castle of Cardona. The Asturias were now the centre of Moorish invasions, and laid the foundations of a power which, after a hundred and twenty years of unremitting and bloody warfare, accomplished the final extinction of the Moorish invader from the peninsula.

(Mariana, Historia General de España, lib. viii., chapter 1; Masueu, Historia Critica, vol. xii.; Conde, Historia de la conquista de los árabes de España, vol. i. p. 73; Bar- bon, Cartas para ilustrar la Historia de España, Madrid 1806.)

PELECA'NIDÆ. Dr. Leach's name for a family of Nudatoria, or Swimming Birds. (See Birds.)

The genus of Nudator, placed in the 'Systema Naturae' between Diomedes and Ploceus, contains three Pelicans (Pelecanus onocrotalus), the Frigate Bird (Man-of-War Bird (Tachytes)), under the division of the Aquila, the Cormorant (Pelecanus Carbo and Gregalis), and the Solan Goose (Pelecanus). (See Birds.)

The Tropoljus of Cuvier (comprising those Podargus which have the hind toe united with the others in a single membrane, perch on trees, and are good fliers, and have a short wing) constist of the Podargus (Pelecanus, Linn.) or the. . .

legs) consist of the species of the Podargus (Pelecanus, Linn.), comprising all those which have the tail disposed of feathers. Their nostrils are slit, the aperture of which is
The true Pelicans are large and heavy birds, with a great extent of wing, and are excellent swimmers. The expansive pouch, whose elasticity is well known to all who have witnessed the shapes into which it is stretched and formed by the diurnal showman, will hold a considerable number of fish, and thus enables the bird to dispose of the superfluous quantity which may be taken during fishing expeditions, either for its own consumption or for the nourishment of its young. In feeding the nestlings,—and the male is said to supply the wants of the female when sitting in the same manner,—the under mandible is pressed against the neck and breast, to assist the bird in disgorgeing the contents of the capacious pouch, and during this action the red nail of the upper mandible would appear to come in contact with the breast, thus laying the foundation, in all probability, for the fable that the Pelican nourishes her young with her blood, and for the attitude in which the imagination of painters has placed the bird in books of emblems, &c., with the blood spiring from the wounds made by the terminating nail of the upper mandible into the gaping mouths of her offspring."

The neighbourhood of rivers, lakes, and the sea-coasts are the haunts of the Pelicans, and they are rarely seen farther than twenty leagues from the land. They appear to be, to a certain extent, gregarious. Le Vaillant, upon visiting the Kasen Eyland, found the flock of pelicans the first thing he saw, on entering the entrance of Saldanha Bay, beheld, as he says, after wading through the surf and clambering up the rocks, such a spectacle as never perhaps appeared to the eye of mortal. "All of a sudden there arose from the whole surface of the island a impenetrable cloud, which formed, at the distance of forty feet above our heads, an immense canopy,
or rather a sky, composed of birds of every species, and of all colours: coromorants, sea-gulls, sea-swallows, pelicans, and, I believe, the whole winged tribe of this part of Africa, were here assembled. All their voices, mixed together and modified according to their different kinds, formed such a hurrid music that I was every moment obliged to cover my head to give a little relief to my ears. The alarm which we spread was so much the more general among these innumerable legions of birds, as we principally disturbed the flocks at times when they were sitting. They had nests, eggs, and young to defend. They were like furious harpies let loose against us, and their cries rendered us almost deaf. They often flew so near us that they flapped their wings in our faces; and although we fired our guns repeatedly, we were not able to frighten them; it seemed almost impossible to disperse this cloud. We could not move one step without crushing either their eggs or their young ones; the earth was entirely strewn with them. The same traveller fish upon the Klein-Brak river, whilst waiting for the ebb tide, thousands of pelicans and flamingoes, the deep rose-colour of the one strongly contrasting with the white of the other.

Geographical Distribution. The species are widely spread (Europe, Asia, Africa, and America), though not numerous: two are Europeans, Pelecanus onocrotalus, and Pelecanus crispus. We select the former as an example.

Description. (Old.) The plumage generally of a fine white tinged with light rose or salmon colour, which is brightest in the breeding season, except the primaries and spurious wing, which are black, and the depending occipital crest and a few pendulous feathers on the lower part of the neck, which are light yellow; naked head and round the eye and at the base of the bill, where the frontal feathers form a point, flesh colour; the upper mandible bluish, with a crimson line running along the top, reddish at the base, yellowish at the tip, and the terminal nail red; gular pouch yellow; instead bright reddish brown, or hazel; bill of moderate length. Length from five to six feet; expansa of wings twelve or thirteen feet. Sexes similar.

Young of the year, and those of a year old. Whitish ash throughout; bill white; wings and back very white; oil ash; also the borders bordered with brighter ash; quills blackish ash; bill and naked parts livid; iris brown. The first white feathers appear on the neck and belly. (Temm.) Mr. Gould (Birds of Europe) says that the bird is remarkable for longevity, and for the long period requisite for the completion of its plumage. The first year's dress he describes as wholly brown, the feathers of the back and breast being broad and rounded. The lanceolate feathers and the rosy tints are only acquired as the bird advances in age, and Mr. Gould says, that coming from trees, in particular from the brink of cascades, he has seen them at such times, particularly if their pouches be loaded with fish. Though they can perch on trees, they are most generally seen either on the wing or swimming. Some specimens apparently in mature plumage, have the bill quite smooth above; but individuals have a long beak with a process, about two inches high, springing from the ridge of the upper mandible. Similar processes existed in the specimens commented upon by Pennant and Forster, which were brought from Hudson's Bay; but no such apparently have been described as occurring on the bills of the

Cape of Good Hope, differed in nothing from those of Europe, except in their greater dimensions. That the species exists in Asia there is no doubt. Belon, who refers to the Mediterranean, says that it is frequent in the lakes of Egypt and Jutja. When he was passing the plain of Roma, which is only half a day's journey from Jutja, he saw them flying in pairs like swans above his head, rather low; and adds that they are seen flying in a large flock like those birds. Hasselquist saw it at Damietta in Egypt. He also adds that it comes to Egypt in the middle of September, in his chapter on the arrival there of migrating birds. 'In Syriga,' says Hasselquist, 'they form an acute angle, like the common wild geese when they migrate. In the summer, they inhabit the Black Sea and coasts of Greece; and in their migration remain for a few days near Smyrna and other parts of the coasts of Nolitia, but never stay far from the continent: they fly very high. Some of them remain at Damietta, and in the islands of the delta in the Mediterranean, but the greater part go to Egypt.' They appear in some of the Egyptian drawings. (Rosellini.)

Dr. Von Siebold and M. Bürger saw it in Japan, and their observation is confirmed by M. Temminck. Mr. Gould states that though the tropical climates of Africa and India constitute its natural habitat, nevertheless the eastern rivers of Europe, such as the Danube and Volga, the extensive lakes of Hungary and Russia, and the shores of the Caspian Sea are places of abode. The same author says that it is a species strictly confined to the Old World, over a great part of which it is distributed. The Prince of Musignano, in Specchio Comparato, quotes it as being rare and adventitious at Philadelphia and Rome. Dr. Richardson quotes it as being common in the Mississippi, 56° N. lat. 'Pelicans,' says the Doctor, 'are numerous in the interior of the fur countries up to the sixty-first parallel; but they seldom come within two hundred miles of Hudson's Bay. They deposit their eggs usually in small rocky islands on the brink of cascades, but they can scarcely be approached; but they are otherwise by no means shy birds. They fly low and heavily, usually in flocks from six to fourteen, sometimes abreast, at other times in an oblique line; and they often pass close over a building or within a few yards of a party of men without exhibiting any signs of fear. They haunt eddies under waterfalls, and devour great quantities of carp and other fish. When gorged with food, they doze on the water, and may be easily captured, as they have great difficulty in wing at such times, particularly if their pouches be loaded with fish. Though they can perch on trees, they are most generally seen either on the wing or swimming. Some specimens, apparently in mature plumage, have the bill quite smooth above; but individuals have a long beak with a process, about two inches high, springing from the ridge of the upper mandible. Similar processes existed in the specimens commented upon by Pennant and Forster, which were brought from Hudson's Bay; but no such apparently have been described as occurring on the bills of the

Pelecanus onocrotalus

Pelecanus crispus
Pelicans of the Old Continent. The Prince above quoted, in his later Geographical and Comparative List, erases Pelecanus from the column of American birds, supplanting its place by Pelecanus trachyrhynchos, Lin., (Pelecanus trachyrhynchos, Gmel. Pelecanus americanus, Aud.) and this probably is the species alluded to by Dr. Richardson: indeed there can be little or no doubt of it.

The following notes, by Professor Owen, throw much light on the organization of birds of this group as applicable to their habits.

The Pelican which he dissected—Red-bachked Pelican of Latham, Pelecanus rufescens, Gmel., a female—measured through its outer tail feathers nine inches in length, from the point of the beak to the vent, and ten inches and a half from the extremity of the upper mandible to the nostrils. These, says the Professor, are almost concealed slits in the lateral grooves of the upper mandible, just anterior to the skin of the head. They will barely admit the flat end of a probe; and lead almost vertically to the internal apertures of the nasal cavity. The air-cells in the Pelican, as in the nearly allied bird the Gannet, Sula bassana, Temm., are remarkably extended and diffused over the body; the whole cellular tissue, even to the tips of the wings and the end of the fleshly part of the legs, can be blown up from the trachea.

The extent to which the skeleton of the Pelican is permeated by air has been particularly noted by Mr. Hunter in his celebrated paper 'On the Air-cells of Birds,' in which he throws out a new theory of the development of the feathers, and in which he adduced the fact that in carrying heavy loads in their large fowls. This supposed relation of extended air-cells to a largely developed beak is borne out in the case of the Hornbill, in which the air-cells are placed, it is said, almost wholly in the mandibles, and a previous accumulation in its dilatable anaphagous.

Mr. Hunter, it may be remembered, was doubtful, on the whole, of the utility of plumage, and his notion was that the mandibles derived their gaseous contents: not that he was ignorant of the air-holes in the bones, as he is careful to tell us in the reprint of the Memoir, in the 'Animal Economy,' where he states that the lower jaw of the 'Pelican is furnished with air, which is supplied by means of the Kastachian tube.'

'To ascertain the correctness of this description, I saw across the left ramus of the lower jaw; but on blowing into the end of the part attached to the head, I found that the Kastachian tube (the orifice of which is a slit, situated on the roof of the mouth, one inch behind the posterior or internal nare), but filled, first the air-cells under the throat, and then, as the latter was exhausted, the air passed into the air-cells of the submaxillary mandible, and from thence into the quadrate.

On dissection, I found that the air passed into the lower mandible immediately from an air-cell surrounding the articulation between the jaw and os quadratum, which received its air from the lungs by means of the cells passing along the neck and throat, &c. The authority of Mr. Hunter ought not to be set aside by the result of a single experiment; and the possibility of accidental rupture may be urged against the above observation; but it is at all events worthy of being recorded, and should be rejudged when opportunity occurs, with the method of blowing into the Kastachian tube, which I omitted to do.

There is little to be added to the accounts already given in the works of Cuvier, and of Professor Tiedemann and Cuvier, of the digestive organs of the Pelican. The weak or flattened stomach, small cecca, and short intestines bespeak its animal diet; and the uniformly capacious asophasus, as well as the supradded faucial bag, may be regarded as pointing to the piscivorous habits of this singular animal. The pelvic cavity interposed between the gizzard and the duodenum, which the Pelican has in common with some of the piscivorous Grallata, viz. those of the genus Ardea. In them the ploric cavity is very small, but in the Pelican it is fully as large and as filled with air, as in any of the same order. The gas contained in the cavity is common to the gizzard and the duodenum, which the Pelican has in common with some of the piscivorous Grallata, viz. those of the genus Ardea. In them the pyloric cavity is very small, but in the Pelican it is fully as large and as filled with air, as in any of the same order. The gas contained in the cavity is common to the gizzard and the duodenum, which the Pelican has in common with some of the piscivorous Grallata, viz. those of the genus Ardea.
misconceived. He describes the additional bone as about one inch in length, triangular in shape, somewhat grooved on its surfaces, and, from its articulation with the occiput, tapering gradually to a point. The mode by which this bone is articulated to the occiput is considered by Mr. Yarrell to be similar to that observed in the ribs of serpents, in which the condyle is situated upon each vertebra, and the cavity is at the end of the rib: so in the Cormorant, the condyle is upturned to the local bone, the cavity of the triangular end of the sphenoid bone; the joint is therefore hemispherical, admitting great extent of motion. Mr. Yarrell then notices the great length of the os quadratum (c) from above downwards, in this and other birds which feed off the fish. The articulation of this bone, he observes, both with the cranium itself, as well as with the lower mandible, admits great latitude of motion. It moves with facility backwards, forwards, outwards, and inwards, by the action of the numerous muscles attached to it, thus increasing the capacity of the pharynx for the more easy passage of any unusually large fish. The rami of the lower mandibles are comparatively slender, weak, and elastic, and hence the value of the additional pair of muscles described by Mr. Yarrell, muscles which are not, he states, possessed by any of the species of Columbidae, Alce, Uria, and Larus, all of which have the rami of the lower mandibles much deeper and thicker in proportion.

The sphenoid or sword-shaped bone is described by Mr. Yarrell as having three surfaces, each slightly concave, forming together an isosceles triangle, the base of which is downwards. 'From the upper edge of this bone,' says Mr. Yarrell, 'to its lateral angle, throughout its whole length, from the extreme point to the occiput, there arises on each side a triangular-shaped local bone, the cavity of the triangular end of which is directed forwards, backwards, downwards, and outwards, to be inserted by a strong tendon upon the upper edge of the lower mandible, immediately behind the insertion of the tendon of the temporal muscle. The muscles of the upper part of the neck, giving motion to the head, are inserted upon this occipital bone and its elevated crest, over which these additional muscles slide with every movement of the head, the particular articulation of the sphenoid bone only permitting it to become a fixed point of support to its own particular muscles, when both act simultaneously as additional elevators of the lower mandible, thus assisting in prehension, and materially increasing the power of the bird in securing a slippery prey. I may here also observe that the various other species of fish-feeding birds before referred to, as having their lower mandibles so much stouter and stronger than the corvorant, have also much deeper fossae and more elevated ridges for the origin and attachment of their temporal muscles, and are in this way better able to prevent the escape of their natural food, without the additional muscles of the corvornant. From these comparative remarks, it will be perceived that the corvornant does not possess the same strength of bone in the mandibles with the other oceanic fish-feeders, though not less inclined than the corvornant to pursue and take fish of large size. The dilatation of which the lower mandible is capable from its elasticity, the length and freedom of motion of the os quadratum, the great size of the os quadratum, which, when distended, measures ten inches in circumference, all afford facilities for the swallowing of prey, which, but for his additional muscles, he would probably be unable to hold. This peculiarity of structure is most likely to be found in other species of the genus Pe-
and Cormoran of the French; Schabe and See-Rabe of the Germans; Sharp and Strand-Raam of the Norwegians; Aderhake of the Danes; Skufar of the Icelanders; Miltran and Merfyan of the ancient British; Cormorant and Comorant of the modern British. This is the Corbus Atratus of Genner, Ray, and others; Pellecanus Carbo of Linnaeus; Phalacrocorax Carbo of Cuvier and others; and Carbo Cormoraneus of Meyer and others.

It has been a question how the English name of the bird should be spelled, and whether it is Cormorant, which is the form used by Montagu, Latham, Pennant, and Dr. Caius, the last of whom derives the word from Corvus coram. Cormorant is considered a corruption by those who else derive this derivation. Milton, Ray, and Willughby wrote Cormorant, which is the form now generally used by British ornithologists.

Geographical Distribution very extensive. The species is an inhabitant of the New as well as the Old Continent. In the latter it is more widely distributed; it is found in a considerable portion of Europe, especially the north. Temminck notes it as very abundant in Holland in all seasons, as common in England and France, but rare in Germany and the south. It appears in the 'Geographical List' of the birds of Morocco. It is common in Italy and the southern parts of Europe generally and of America. In the 'Speech Comparativo' it is noted as not very rare in winter at Rome, but rare in winter at Philadelphia. In the lately published part 4th of his 'Manuel,' M. Temminck notes it as common in Portugal, especially in the south, and in the Azores, but very little from that of our climates, it is nevertheless distinct; but he states that he has received a specimen from India resembling our species in every respect: it is, he says, common in some parts of the Ganges, but is not seen in that of the Brahmaputra.

Habits, Food, Reproduction, &c. — The Cormorant swims very low in the water; even in the sea the body is deeply immersed, little more than the neck and head being visible above the surface. The expert diver, pursuing the fish which form its food with great activity. It is said to be very fond of eels. It flies with the neck outstretched, and may be often seen drying its drenched plumage on the shore or on insulated rocks. It perches on trees, where it is inordinately fond; it builds its nest, but mostly selects rocky shores and islands, selecting, according to Selby, the summits, and not (like the Green Cormorant) the cliffs or ledges. The author last quoted states that upon the Forn Islands its nest is composed entirely of a mass of sea-weed, frequently heaped up to the height of two feet, in which are deposited from three to five eggs of a pale bluish-white, with a rough surface. 'The young,' continues Mr. Selby, 'when first hatched, are quite naked and very ugly, the skin being of a purplish-black; this in six or seven days is covered with a thick down, but in about six weeks the feathered plumage is not perfected in less than five or six weeks. I have repeatedly found that, upon being thrown into the sea, even when scarcely half fledged, they do not playantly plunge, beat on the surface, and escape by diving. This they do to a great distance, using their imperfect wings, and pursuing their subsistence flight in the same manner and almost with as much success as their parents.'

The old French quatrains in the 'Portraits d'Oyeaux' give no bad account of the habits of this bird:—

Le Cormorant est oyeau bien cuisin,
Hantant les eaux loin douces que salines,
C'est par que l'estrum sont piles,
Et des eustaghe l'amour revenir.

Phalacrocorax Carbo. Adult male, in spring plumage. (From.)

It's vanity is indeed great, and the way in which it will dispose of a large fish, a place for instance, aided in a great measure by the powers of compression and dilation conferred on it by the apparatus noticed above, is surprising. The species is easily domesticated. More domesticated, who kept one, gives a favourable account of its disposition, and indeed their docility is shown by the use made of them formerly in fishing. Willughby, quoting Faber, says: 'They are wont in England to train Cormorants to fishing. When they carry them out of the room where they are kept to the fishpools, they hoodwink them, that they be not frightened by the way. When they are come to the rivers, they take off their hoods, and having tied a leather thong round the lower part of their necks, that they may not swallow down the fish they catch, they throw them into the river. They presently dive under water, and there for a long time, with wonderful swiftness, pursue the fish, and when they have caught them, they arise presently to the top of the water, and pressing the fish lightly with their bills, they swallow them till each bird hath after this manner devoured five or six fishes. Then their keepers and masters of supplying him they readily fly, and little by little, one after another, vomit up all their fish a little broiled with the nip they gav them with their bills. When they have done fishing, setting the birds on some high place, they loosen the string from their necks, and the birds falling down, they throw them part of the prey they have caught, to each perchance one or two fishes, which they by the way, as they are falling in the air, will catch most dexterously in their mouths. This kind of fishing with cormorants is, it seems, also used in the kingdom of China, as Nieembergus out of Mendoza relates.' Pennant cites Whiteflock, who says that he had a cast of them maneled like hawks, and which would come to hand. 'He took much pleasure in them, and relates that the best he had was one presented him by Mr. Wood, master of the cormorants to Charles I.' It is well known, adds Pennant, that the Chinese make great use of a congenorous sort in fishing, and that for amusement but profit.

Sir George Staunton (Embassy to China) states that the embassy, in its journey to Han-choo-foo, 'had not proceeded far on the southern branch of the canal, when they arrived in the vicinity of the place where the Lu-tee, or famed fishing-bird of China (Phalacrocorax Sinensis) is bred, and there they saw the birds.érique, as the owner with fish in great abundance. It is a species of the pelican, resembling the common cormorant, but which, on a specimen being submitted to Dr. Shaw, he has distinguished in the following terms: — Brown pelican or cormorant with white throat, the body white beneath and spotted with brown; the tail rounded; the irides blue; the bill yellow.' The bird, an undoubted cormorant, is figured in the Atta, pl. 37, and a vignette at the end of the chapter shows two Chinese fishermen carrying their light boat around the gunnel of which their cormorants are perched by a pole, resting on their shoulders, between them. Sir George further says: 'On a large lake close to this part of the canal, and to the eastward of it, are thousands of small boats and rafts, built entirely for this species of fishing. On each boat or raft are ten or a dozen birds, which, at a signal from the owner, plunge into the water; and it is astonishing to see the enormous size of fish with which they return grasped between their bills. They appeared to be so well trained that it did not require either ring or cord about their throats to prevent them from swallowing any portion of their prey, except what the master was pleased to return to them for encouragement and food. The boat used by these fishermen is of a remarkable light make, and is often carried to the lake, together with the fishing birds, by the men who are there to be supported by it.'
the sea like the bolt of an 'arbalaste,' till the poor cor-
morant, who is shot at with bows as soon as he puts his head
above water. But if, after diving to suffo-
cation, is taken quite tired out by his pursuers.
Phalacrocorax Crisatus (Old, in Winter dress).—The
whole plumage of the most beautiful resplendent and lus-
trious green; upper part of the back, scapulars, and wing
and tail coverts, of a fine bronze; each feather framed as
it were by a narrow band of beautiful velvety black; extre-
mitv of the wings not reaching beyond the origin of the
tail, which is short, rounded, and of a dead black; base
of the bill and very small gular pouch fine yellow; bill
brown; feet black; iris green. Length about 2 feet 1 or 2 inches.
Old, in the Spring or Nuptial Plumage.—At the com-
 mencement of the spring there rises on the middle of the
head, between the eyes, a fine tuft of wide and outspread
feathers, about an inch and a half high, capable of erec-
tion, and which, in that state, present a tufted, or large
plume; on the occiput also are ten or twelve rather long
and subulate feathers. There are never any white feathers
on the neck nor on the thighs, as in the Great Cormorant
last-mentioned species.
The Young of the Year are distinguished from the young
of all the other species by their long and slender bill, their
short tail, and the wide luminous borders which surround all
the feathers of the mantle. The colour of the upper parts
is brown lightly shot with greenish light; that of the lower parts
is sandy-brown more or less whitish.
The bill of this species is very slender, two inches four
lines long, and longer than the head. Tail very short, com-
posed of 12 feathers. (Temm.)
The Cormorant Larup of Temminck; Crested
Corvorant of Pennant; Shag or Green Cormorant of
Gould.
M. Temminck, in the fourth part of his Manuel, states
that Carbo Desmaresoti, Poyrodeau (Phalacrocorax Des-
maresoti, Gould), one of the five European species noticed
by Gould (Birds of Europe) and the Prince of Musignano
(Geographical List), which had hitherto appeared to M.
Temminck to be a distinct species from the Crisatus of the
northern seas, is absolutely identical with it. This last
opinion is founded on the careful comparison of a number
of the so-called Phalacrocorax Desmaresoti from the south,
both adults and in intermediate stages, with individuals
from Iceland, the Faroe Islands, the Orkneys, and the mari-
time coasts of the North Sea. M. Temminck remarks that
it has been observed that the Ph. Desmaresoti has the bill
longer, but in a great number of Larupas from Iceland and
the Faroe Islands only two were found with the bill of exact
length and slenderness.

Habits. Food, Reproduction, &c. — The habits of Ph. cris-
tatus are very similar to those of Ph. Carbo. The nest
is placed in clefts and on ledges of cliffs. Mr. Selby
found that it was composed of a mass of sea-weed, chiefly Fucus
verruculosus, and that the eggs, four or five in number, were
smaller than those of Ph. Carbo, but similar to them in
outer appearance.

Phalacrocorax Crisatus; adult, in summer plumage.  (Gould.)

M. Cantraine, who killed the so-called Ph. Desmaresoti
at Oliggatra, Cantelia, and the Strait of Bonifacio, states
that their principal food consists of the Sparus Boops, and
that they always keep on rocks near the edge of the water
in parties of not more than four; Ph. Carbo, which lives in
the open sea, perches higher on the rocks than the

Localities.—The whole of the North of Europe; very
common in Iceland, the Orkneys, Faroe Islands, Norway,
and Sweden, in the vicinity of great lakes. M. Boule
killed many individuals in lat. 60º (Temm.). To these localities
must be added the Mediterranean basin, which if the
Mediterranean be right, and his opinion does not seem to have been hastily
formed, in considering Ph. Desmaresoti and Ph. crista-
tatus identical. Indeed Mr. Gould mentions the Mediterranea
as a locality of the latter. M. Temminck remarks that the
European species, which at certain points resembles Ph.
crisatus, differs, notwithstanding, essentially from it, espe-
cially in the extremely slender form of the bill, the colours
of the plumage, and the totally different form of the crest.

Puitos. (Linn. Klein.)

Generic Character.—Bill longer than the head, quite
straight, firm though slender, obliquely dentate on the
edges, which are bent inwards, and terminating in a very
sharp point. Face and throat naked. "Nostrils linear.
Feet short and robust. Wings short; second, third, and
fourth quills longest; tail very long, the feathers stiff and
elaborate.

This is the genus Anhinga of Brissou; Pituos of Scopoli;
and Pituus of Malm.

Geographical Distribution of the Genus.—Species of
Pituos, or Dartor, as it has been called by English and
French ornithologists, are found in the Old and New
Continents.

These extraordinary birds are well described by Boffon
when he says, 'The Anhinga offers us a reptile graze on
the top of a bird.' Those who have seen the long neck,
and that of the neck rising from the herbage, may say a
casual observer might well take it for a snake. Vaillant states that
the neck of the species seen by him in Africa was always in
oscillation when the bird was perched; and that any one
who saw its tortuous movements among the herbage, the
body being concealed, would take it for one of the
tree-serpents. The form indeed was considered by the older
voyagers as a monster partaking of the nature of the snake
and the duck; and Wilson states that on the amaryllis
charts which he had seen, the creature was delineated with
all the extravagance of fiction. In flight the neck is
stretched out, immovable, in a line with the body.

African Darters, or Snake-Birds.
Pituos Lervallantii. (Nuptial Plumage.)—Bill yellow;
feet yellow; all the upper part of the head and back of
the neck black, the latter bordered with white; the neck
descends to the shoulders; forehead, cheeks, and sides of
the neck pure white; throat and anterior part of the neck
pale ochraceous yellow; breast and all the under parts
of the body deep black with greenish reflections; the lower
parts of the wings, the back of the neck, and the lower
parts of the tail, entirely white; the whole of the mantle and the small covert
brown, with the middle of each feather of a bright rusy
colour; tail-feathers and quills brown, some of the latter
terminated with rust-colour.

This is Pituos Africana of Swainson.

Habits.—Le Vaillant in his usual lively style relates
how he was induced to visit a rich proprietor in the fertile
canton of the Twenty-four Rivers to the north-east of Swar-
ness (Swarisses), after he had detemined of black shee.
Plying, by the tempting description of two extraordinary birds
which habitually haunted the vicinity of this proprietor's
habitation, and which, from the description, he knew must
be Anhingas. They frequented a particular tree, and
shelled him more than once; at last the bird, within shot,
and killed them both, right and left. His Hottentots called
them Stange-Halo-Vogel (bird with a serpent's neck). He describes them as
diving "entre deux eaux" for fish when they caught a small one it was swallowed whole,
when they caught a large one it was carried to a large
trunk of a tree, and the bird, fixing it beneath its feet,
picked it to pieces with its bill. Though the water is this
favourite element, it is upon trees or rocks, he tells us, that
it establishes its nest and brings up its young, taking care
to place the eggs so that they may be easily transported into the
river, as soon as they are able to swim, or whatsoever
the safety of the little family requires it. He describes it as
most difficult of approach, especially when swimming, and
when nothing but the head is to be seen; the instant the
fint struck the steel the bird dived, and often when it was
looked for a head, it had doubled back in its diving, and then
took wing far behind the sportsman.

Localities.—Senegal, Cape of Good Hope; part of the
coasts of Asia (Lesson).

Plotos Levalliantii.

AMERICAN DARTEES.

Example, Plotos Anhinga—Plotos Americanus (Sw.).

Description.—**Male.**—Bill 3 inches long, rather slender,
very sharp pointed, and armed with numerous sharp teeth
from the tip, for the securing its prey; black above,
white below; bare space round the eye and pouch under
the chin yellow; slit of the mouth extending beyond the
eye; iris vivid red; head, neck, and all the lower parts
black glossed with dark green; side of the neck, from the
eye backwards for more than half its length, marked by a
strap of brownish-white, consisting of long hair-like tufts of
plumage extending an inch beyond the common surface,
resembling the hair of callow young; a few small tufts on
the crown; the whole upper parts black, marked in a very
singular and beautiful manner with small oval spots and
long pointed streaks of a light-yellow which has the gloss of
silver in some lights; middle of the back, primaries, secondaries,
rump, and tail-coverts plain glossy black; on the
upper part of the back the white is in very small oval spots
lengthening as they approach the scapulars and tertials, on
the latter they extend the whole length of the feathers,
running down the centre (these are black shafted), the
wings long and pointed; lesser coverts marked on every
feather with an oval or spade-shaped spot of white; greater
covers nearly all of a light white; tail long, rounded, and
exceedingly stiff, consisting of 12 broad feathers, the ex-
terior vanes of the four middle ones curiously crimped, the
whole black and broadly tipped with dirty brownish-white;
thighs black; legs scarcely an inch and a half long; feet
webbed, all the four toes united by the membrane, which is
of uncommon breadth; exterior toe, the longest, 3 inches;
claws horn-colour, strong and crooked, inner side of the
middle one pectinated; legs and feet yellow. All the
plumage very stiff and elastic; that of the neck and breast
thick, soft, and shining. Length 9 feet 3 inches.

**Female.**—Differs in having the neck before of a roan colour
or iron-grey, the breast the same, but lighter and tinged
with pale chestnut; belly as in the male—where the iron-
grey joins the black on the belly, there is a narrow band
of chestnut; upper head and back of the neck dark sooty-
brown streaked with blackish; cheeks and chin pale yellow-shade;
in every other respect the same as the male, except in having only a few slight tufts of hair along the
side of the neck; tail 12 inches long to its insertion, generally
spread out like a fan, and crimped, like the other, on
the two outer vanes of the two middle feathers only. Length
3 feet 6 inches. (Wilson.)

Habits.—Here is in this river (St. Juan, East Florida)
and in the waters all over Florida, says Bartram, speaking
not very large; it contained two eggs and six young ones, the latter varying much in size; they would occupy the same tree for a series of years. They commonly sit on a stump which rises out of the water, in the mornings of the spring, and spread their wings to the sun, from which circumstance they have obtained the appellation of Sun-birds. They are difficult to be shot when swimming, in consequence of only their topmost or first part of the tail being above the water.

Localities.—The Carolinas, Georgia, and the Floridas; common in Brazil and Cayenne.

Fregata. (Rat.)

Generic Character.—Bill long, robust, strong, trencrchant, depressed at the base, widensed on the sides, with a suture above, the mandibles very much hooked at the point, and the gape very wide; nostrils linear: orbits naked; throat downy; neck and back covered with long and short quills very long: feet short: the toes united by a membraune which is deeply notched. This is the genus Tachypetes of Vieillot.

The Man-of-War Birds, or Frigates, are eminently raptorial. They are covered with dark brown, blackish plumage, with kite-like glidings. Their immense extent of wing and dashing habits have obtained for them the name of the swiftest sailing ships of war that sweep the seas. Mr. Vigors (Zinn. TRANS., vol. xiv.), who, as we have seen, was one of the greatest observers we at belonging to this family, observed that in those genera we find a still more immediate approach than we find in the closely allied cormorants to the birds of prey, in their raptorial habits, their soaring and aerial flight, and the rapid seizure of their prey. The immense and immersing wings in the air, where they seek it. 'Tachypetes in particular,' says Mr. Vigors, 'exhibits in its general habits and structure the most conclusive evidence of this affinity, and of its devotion at the same time from the Nataores. Although for the most part it pursues its habits of rapine at immense distances from the shore, and derives its support exclusively from the ocean, it is never known to rest upon its surface. It does not possess in fact, to a sufficient extent, those glands which by their only secretions preserve the plumage of certain birds from the effects of the water; while the extreme disproportion of its hinder extremities deprives it of the power of either swimming or walking. On observing the structure of its legs, we immediately detect this deficiency. Short, weak, and thin, they are equally unsuited to the land and the water. Its powers of motion and the characters by which it maintains its station in nature are in fact centred in its wings. Supported in its unlimited flights by the strength and expansion of these met with, with aided by the air which unchains it from its tail and the buoyant nature of the inflated sac which extends to its throat, it seems to be an inhabitant of the air rather than of the land, where it resorts alone for the duties of its nest, or of the water, over which it only hovers for its prey. These characters, strongly marked, are evidently those of a character which it thus appears as it were to fluctuate between the confines of the two orders before us, did not escape the penetrating eye of Linnaeus, who, by the name of Pelecanus Aquilina which he assigned it, pointed out at once its place among the aquatic birds and its affinity to the auquilus.

The best and perhaps the only satisfactorily defined species is that just above mentioned.

Description.—Tail forked, body black, bill red, oribits black. The male is entirely black: abdomen of the female which is seen above the wings is to fourteen feet, an almost incredible expance.

Habits.—Sloane, who saw them at Jamaica, describes them under the name of Men-of-War Birds, as appearing in the bay near Port Royal. 'They fly,' says he, 'like kites, low in the air, with large wings in proportion to their body; they fight with sea-gulls (which are found to be here, and are like ours) for their prey.' It is however but an unequal fight, for the poor gull has not much chance when opposed to the sweep of the Frigate. The same author gives a much more detailed account of their habits afterwards (p. 393). He saw them together with Trochilus when he came into lat. 15° 10'. 'This bird,' remarks Sloane, in his section Of Men-of-War Birds, 'seems very large, bigger than a kite, and beaks, body, &c., like kites, very much, and often at war incessantly over the water, to wait for and catch small fish appearing on the surface: they are sharp winged and their tail is forked. When flying-fishes are persecuted under water by dolphins, bonitos, &c., they rise and fly for some space in the air, and are often devoured by these birds which pursue them first and, it is wondered how they can direct themselves to the land, being so far distant, but: the sea, they come into the ports and bays to fish, where the wind is broken off by the land, and the same wind blowing them in brings in the shipping after them. There are more of these in the firm land of America than in the islands. One of these birds at Panama coming to take sardines that was in a curing in the sun, a negro broke his wing with a stick he had in his hand: the body, after it was clear of its feathers, was little bigger than a pigeon. The wings being extended, no man, though several tried, could reach with his arms to the tips of them. The fish was considered by the Indians and others a sovereign remedy in some diseases, such as scurvy, &c.

The next is said to be built on rocks in small desert islands, on lofty cliffs, or in high trees in retired situations. We saw them at one time in the midst of the ocean, far from the land, and to be of crimson tinge and dotted with emeralds. The newly hatched young are said to be covered with a down. For the tyranny with which the Frigate treats the unfortunate Gannets, see the article Booby, vol. s. p. iv Geographical Distribution.—Very common on the inter-tropical American coasts, and in the Atlantic and Pacific oceans, but always within reach of land.

PELECANOIDES. (PETRELS.)
PELECANONUS. (TERNS.)
PELECANUS. (PELECANIDS.)

Frigate, or Man-of-War Bird; the gular pouch not dilated.
them in 1783, he found no quadrupeds except rats; but now there are cattle, goats, and hogs. The sheep that were eaten by rabbits, there are now, in great numbers, killed by the inhabitants for food. His suspicions were not unfounded, for some unknown reason, but the hogs and goats thrive well. Cattle are stated to have become abundant, which is probable, as Captain Wilson found many tracts covered with grass. The vessels which make the outer passage to Canton stop at these islands for provisions. Wild swine are numerous. There is also a large kind of black pigeon, and a bat of enormous size. Several kinds of fish are plentiful, and some of them are of great size; sharks are eaten. Turtles abound, as well as shell-fish, such as oysters, clams, and others. The principal objects of cultivation are yams, bananas, and sugar-cane, and turmeric are also raised. There are betel-nut trees, oranges, and limes, but they are not abundant. The bamboo and the bread-fruit tree grow wild in the forests, and also the cabbage tree and a tree the fruit of which resembles almonds. The timber-trees of great size; a single tree is frequently converted by the inhabitants into a boat capable of carrying 25 or 30 men.

Pellian traders are a tribe of Malays. They are very good-natured, and received Captain Wilson and his crew with great kindness. They wear no clothes, and drink only water and the juice of the cocoa-nut and of the sugar-cane without distillation. Their huts are made in a very simple way, but they have now erected in the construction of their boats. Their cooking utensils are made of wood and are burned in the same manner as our coarse pottery.

(Kente's Account of the Pelew Islands; and Delano's Narrative of Voyages and Travels.)

PELINDA. [RINGIDER.] PELION. MOUNT. [THESSALY.] PELIUS. [VIPERIDE.]

PELL, JOHN, an eminent English mathematician, was born at Southwick in Sussex, March 1st, 1610, where his father was minister. From an astrological horoscope, preserved among Ashmole's collections at Oxford, we learn that he was born at 21 minutes after one o'clock in the noon of that day. He was educated at Christ's College, Cambridge, and gained his B.A. degree in 1630. He studied at Cambridge, and made so rapid a proficiency in the Latin, Greek, and Hebrew languages, that at the early age of thirteen he was sent to Trinity College, Cambridge. He never offered himself however a candidate at the election for a fellowship. After their Sidells on the works of the Ancients and philosophers. He was admitted to an ad eundem degree in the university of Oxford, having proceeded to the degree of master of arts at Cambridge the previous year. In 1632 he married Ithamaris, second daughter of Mr. Henry Regnoise, of London, by whose death he was left a rich widow. He then proceeded to Oxford, and had by the time he had acquired a mathematical reputation by the publication of several works, and when a vacancy occurred in the mathematical chair at Amsterdam, in 1639, Sir William Petty, an English resident with the States-General, used his interest that the same time he took the degree of doctor of divinity. It was not filled up however till 1643, when Pell was chosen; and he greatly distinguished himself in this situation by his lectures on Diophantus, and on various other parts of the mathematics. In 1646, on the invitation of the Prince of Orange, he removed to the new college at Breda, as professor of mathematics, with a salary of 1000 guilders per annum. In 1652 he returned to England, but in two years afterwards, in 1654, he was chosen, by the protector Cromwell, to be master of the new college, which had been established near Cambridge, and continued in Switzerland till June 23, 1658, when he set out for Breda, where he arrived about the time of Cromwell's death. His diaries and correspondence during this period are still preserved among the Landesmuseum of the British collection of manuscripts, and are valuable for the history of this period. His negotiations abroad gave afterwards general satisfaction, as it appeared he had done no small service to the interest of King Charles II. and of the church of England. Having entered holy orders, he was instituted, in 1661, to the rectory of Fobbing in Essex, with the chapel of Battlesden annexed, on the presentation of the king. In 1673 he was presented, by Dr. Sheldon, then bishop of London, to the rectory of Langdon in Essex; and about the same time he took the degree of doctor of divinity. Shortly afterwards his patron was translated to the archbishopric of Canterbury, and made him one of his domestic chaplains. Such an appointment is generally considered to be a step to higher preferment, but Dr. Pell was so intent on the philosophic, mathematical sciences, that he neglected his own interest, and even so much so as to make him indent with respect to the management of his worldly affairs, that he would have disgraced the station of a dignitary. Anthony Wood says that he was a shiftless man, and his tenants and relations dealt, not kindly with him, that they cozened him of the profits of his parsonage, and kept him so indigent that he wanted necessaries, and even paper and ink, to his dying day. In the midst of his incessant application to his studies, owing to the neglect of his affairs his embarrassments increased, and he incurred debts, which proved the occasion of his being twice in the King's Bench prison. Being at length reduced to great indigence, he was invited by Dr. Whistler, in March, 1682, to live in the college of physicians. Here he continued only for a few months, the ill health which was attributed to him for removing to the house of a grandscale of this, in St. Margaret's, Westminster. He afterwards removed to the house of Mr. Cotterham, reader of the church of St. Giles's in the Fields, where he died, on the 12th of December, 1685, in the seventy-fourth year of his age, and was interred at the expense of Dr. Busby, master of Westminster school, and Mr. Sharp, rector of St. Giles's, in the rector's vault under that church.

Dr. Pell's reputation as an arithmetician and mathematician was great in his own time, and he deservedly held a high position in the history of the mathematics of the seventeenth century. It was to Pell that Newton first developed his invention of fluxions; and the original letter containing his method, which was printed in the 'Commercium Epistolicum,' has been recently discovered by the late Professor Rigaud in the library of the earl of Maccausfield. Dr. Pell published the following works:

2. 'A Letter to Theodore Hook concerning Easter,' 4to, Lond., 1664. The original manuscript is in the British Museum, MS. Sloane, 4110. This is merely in favor of what was then called the New Style, and consists only of several pages.
3. 'An Idea of the Mathematics.' Printed at the end of Mr. John Durie's 'Reformer Library-keeper.'
4. 'A table of Ten Thousand Square Numbers, viz. of all the Square Numbers between 0 and 100 millions, and also of the whole numbers between 0 and ten thousand,' fol., Lond., 1672, 17 pp.
5. 'Rhinius's Algebra, translated out of the High Dutch into English by Thomas Branker, much altered and amended, by Dr. John Pell,' 4to, London, 1668. In this work Dr. Pell first invented the notation of representing the steps of different equations, which was then adopted by many learned writers, but has now fallen out of use: the last work that we know of which contains it is Butler's 'Introduction to the Mathematics,' published in 1813. Here he also introduced the character $1/2$ for division, which is now employed.

Besides these, he published several single-leaf controversial pamphlets, the numbers of which we have not been able to ascertain. His manuscripts and letters still remaining are numerous, and perhaps in no similar instance have papers been so carefully preserved. In the British Museum alone are preserved nearly 600 volumes, none of them very small, of his letters and mathematical works. He was supposed by Dr. Hutton to have been deposited in the library of the Royal Society, but it has been shown (Hallowell's 'Life of Sir S. Morland, p. 27-30) that they are all deposited in the British Museum, with the exception perhaps of a few manuscripts. In the Harleian collection there are three other similar volumes, which are no doubt belonged to the series, and it is difficult to say how they could have been transferred to that library.

Dr. Hutton says that he is the editor of some of his manuscripts at Bretenet in Cheshire, where he resided some time before the seat of William Lord Bretenet, who had been his pupil at Breda. In August, 1844, he was preparing for the press a new edition of Diophantus, one of his most favourite books, in which he intended to correct the translation and make new illustrations, but this project was never perfected.
He designed likewise to publish an edition of Apollonius, but laid it aside in May, 1645, at the desire of Golius, who was engaged in an edition of that author from an Arabic manuscript given him at Aleppo eighteen years before. Pell's letters in the Royal Society are addressed principally to Cavendish; and one out of the series has accidentally found its way into a manuscript in the British Museum. MS. Harl. 6796.

PELLA [MACEDONIA] Affecting the skin, and particularly prevalent amongst the peasants of the north of Italy. According to Dr. Holland (whose description, in the 8th volume of the 'London Medical-Chirurgical Transactions,' is by far the best that has been published), in this country the disease affects the poor almost exclusively, and among them chiefly those who are occupied in the culture of the irrigated rice-grounds, and in other parts of agricultural labour. It usually appears first as a disease of the skin, breaking out early in spring, with slight eruption of dark-red blisters on the hands and feet, and sometimes on other parts of the body, accompanied by a slight pricking sensation. Soon after, small tubercles arise upon the inflated blisters, and the skin becomes dry and scaly, and often deformed by the adhesion of the scrotum takes place towards the close of the summer, or even earlier, the skin usually appears quite recovered. This, at least, is the usual progress of the first attack; and there is seldom any greater general disturbance of health than debility, irregular pulse, and affection of thepvig. In the second spring, however, the disease usually recurs with a great aggravation of both the local and the general symptoms, and especially with an increased of the nervous affection, and great anxiety and despondency. In succeeding years, the symptoms wax and wane, with the season, until in the second spring, though it does not, as at first, leave the patient nearly healthy in the autumn and winter. After the third attack, or sometimes later, the weakness of the patient commonly becomes more marked, and he has many symptoms similar to those of scrofula, with constant diarrhoea, and occasional swellings, and various nervous disorders. Its most marked character however is the total despair which fills the patients' minds, from which nothing can rouse them, and which, if the disease is not arrested, in a debilitated state of the body, generally leads to incurable idiocy or mania. In the lunatic hospital at Milan, Dr. Holland found, among 3000 patients, more than one-third in whom the insanity had been the result of pellagra, and 'even this statement gives little idea of the nature of its ravages. The Spartan hospitals are far from sufficient to receive the vast number of persons affected with the pellagra; and the greater proportion perish in their own habitations, or linger wretched spectacles of mortality and decay.' The period during which the disease appears to be in full force is uncertain; but after three or four years, there is usually little hope of benefit from any means that can be adopted. The diseases which, in its later stages, it may lead, or with which it may be complicated, are; of the most varied kinds; and there are few symptoms of which the Italian physicians do not ascribe to its influence.

The pellagra prevails chiefly in the provinces of Lombardy between the Alps and the Po, and especially in the district between the Lago Maggiore and the Lago di Como. Amongst the inhabitants of these parts it has now been supposed to have existed for upwards of a century: here it appears first to have become an object of attention to physicians, and hence to have spread slowly to the Venetian and other provinces of the Peninsula. It is now, however, an hereditary disease; but there is no sufficient evidence for believing it to be propagated by contagion. Its origin and prevalence are rather to be referred to the condition of poverty in which the peasants, though the cultivators of one of the most fertile regions in Europe, are often reduced. Their ordinary diet consists of vegetables, which are usually of inferior quality and ill-prepared: their bread, which is principally made of maize, is for the most part ill-fermented, and often deficient in salt. They rarely have any animal food, and their poverty almost entirely precludes the use of the wines of their own country. Similar wretchedness is evident in their clothing, in their dwellings, and in the deficiency of the common comforts of life. They are thus constantly predisposed to the attacks of diseases of all kinds, and especially to that which is the result of a burning sun during severe agricultural labour. Hence the disease usually makes its first appearance when the peasants are at their most active work, and when the heat of the days is increasing; and hence it is usually first characterized by a disease usually adopted by the Italian physicians for the patients who are admitted into the hospitals is a liberal allowance of wholesome food, and the administration of wine and of tonics of various kinds. There seems less reason to doubt that if wholesome food could be adequately secured for the poor, they would speedily be saved from all the districts in which it now so fatally prevails.

Pellorneum (Ornithology), Mr. Swainson's name for a genus of Crateropodinae, or Babblers. [Metho.] Pelikon, a mineral which occurs amorphous, pelagonite, a mineral which occurs amorphous. Peloponnesus was described. Hardness 3. Brittle, but not remarkably so. Colour bluish-black. Streak brown. Lustre vitreous, nearly dull. Opaque. Specific gravity 2·567. Soluble in hydrochloric acid; solution of a yellowish-green colour, and contains phosphoric acid, and u. n. Pelopis, the son of Hippocles, belonged to one of the principal families of Thebes. He distinguished himself at the battle of Mantineia (n.c. 338), in which the Thebans took part as allies of the Macedonians under the Spartan command of Lycabantes. Pelopidas, wounded and thrown down, was saved from death by Epaminondas, who protected him with his shield, maintaining his ground against the Arcadians until the Macedonians came to his relief and saved both their lives. From this time forward, so severe in time, the friendship of the sons of Thebes with the Pelopidas and Epaminondas, who lasted till the death of the latter. When the Macedonians surprised the citadel of Thebes and established the power of Aegisthus in the year n.c. 322, Epaminondas, the popular party, led to Aegisthus, the wife of Aegisthus, to several other citizens. After a time he and his brother exiles formed a plan with their friends in Thebes for surprising and overthrowing the oligarchy, and restoring the popular party; and when Pelopidas and Epaminondas invited their friends sent from Athens disguised as hunters, found means to be received unobserved, and concealed themselves in the house of a friend, from whence they issued in the night, and having surprised the leaders of the aristocratic party, put them to death; and on the following day, Pelopidas and Epaminondas being proclaimed by the people as their king and commander, they obliged the Spartan king to surrender the citadel by capitulation (n.c. 371). Pelopidas soon after contrived to excite a war between Sparta and Athens, and thus divide the attention of the Pelopidas and Epaminondas was carried on for some years, by struggling parties, and Pelopidas, having obtained the advantage in several skirmishes, ventured to encounter the enemy in the open field at Thermopylae (n.c. 371). Pelopidas was afterwards employed against Alexander, tyrant of Thessaly, who was endangering himself master of all Thessaly, and he defeated him. From this time he was called into Macedonia, to make war between Alexander, king of that country and son of Amyntas II., and his natural brother Polytem. Having re- ceived this, he returned to Thebes, bringing with him Philip, brother of Alexander, and thirty youths of the chief families of Macedonia as hostages. A year after he
ever Ptolemy murdered his brother Alexander and took possession of the throne. Pelopidas, being applied to by the friends of the late king, enlisted a band of mercen-
aries, with which he marched against Ptolemy, who en-
tered into an agreement to hold the government only in
trust for Perdiccas, a younger brother of Alexander, till he
was of age, and to keep the alliance of Thebes; and he gave to
Pelopidas his own son Philexenus and fifty of his com-
panions and partisans first in rank. On the arrival of
Thessaly, was treacherously surprised and made prisoner
by Alexander of Pherae, but the Thebans sent Epaminondas
with an army, who obliged the tyrant to release Pelopidas.
The Thebans soon after, having discovered that the Spartans and
Athenians were at open war with Artaxerxes, king of Persia, sent on their part Pelopidas
with great honour, and Artaxerxes showed him peculiar favour. Pellas, receiving
from Sparta a treaty, in which the Thebans were
styled the king's hereditary friends, and in which the inde-
pendence of each of the Greek states, including Messenia,
was recognised. He thus disappointed the ambition of
Sparta of Athens, which aimed at the supremacy over
the rest. The Athenians were so enraged at this, that they
put their ambassador Timagoras to death on his return to
Athens. Pelopidas after his return was appointed to march
against Alexander of Pherae, who had committed fresh en-
croachments on the Athenian territory. He set his plan by
the point of starting, an eclipse of the sun took place, which
dismayed the Thebans, and Pelopidas was obliged to set off
with only 300 volunteers, trusting to the Thessalians, who
joined him on the march. Alexander met him with a large
army, which had been strengthened by the Phocians, and
exertions, although his army was much inferior in numbers,
obtained an advantage, and the troops of Alexander were
retreating, when Pelopidas, venturing too far amidst the
enemy, was killed.

Pelopidas lies, it is said, one of the most distinguished
and successful commanders of his age, and he and his friend
Epaminondas rank among the most estimable public men of
ancient Greece.

[Plutarch, Pelopidas; Xenophon, Hellenica; Pausanias, ix. 13, 38c.]

PELOPONNESIAN WAR is the name given to the great
contest between Athens and her allies on the one
side, and the Peloponnesian confederacy, headed by Sparta,
on the other. The Peloponnesian confederacy was the actual
state of Greece at the commencement of the war, and
has been briefly described under GREECE [vol. xi., p. 427]. The
war was a consequence of the jealousy by which Sparta
and Athens regarded each other, as states each of which
was aiming at supremacy. The Peloponnesian confederacy
had been formed by the Dorians and Ionian races, and as patrons of
the two opposite forms of civil government, oligarchy and
democracy. The war was eagerly desired by a strong party in
each of those states; but it was necessary to find an occa-
sion for commencing hostilities, especially as a truce for
thirty years had been concluded between Athens and
Sparta in the year b.c. 445. Such an occasion was pre-
vented by the affairs of Corecyra and Potidæa. In a quarrel
which soon became a war between Corinth and Corecyra, re-
specting the commerce of the city of Corecyra in the sea
routes, the Corecyrians applied to Athens for assistance. Their
request was granted, as far as the conclusion of a defensive
alliance between Athens and Corecyra, and an Athenian fleet
was sent to their aid, which however soon engaged in active
hostilities against Corinth, and was largely directed to the
invasion of the Peloponnese. Potidæa, on the isthmus of
Poteidæa, the isthmus of Pallene, was a Corinthian
and, even after its subjection to Athens continued
to receive every year from Corinth certain functionaries or
officers (συνάρμολοι). The Athenians, suspecting
that the Potidæans were about to join in a revolt to which
Perdiccas, king of Macedon, was instigating the towns
of Chalcidice, required them to dismiss the Corinthian func-
tionaries, and to give other pledges of fidelity. The
Potidæans refused, and, with most of the other Cretians of
Pericles, sent an expedition against them, and, after defeating them in battle, laid siege to Potidæa (b.c. 432).
The Corinthians now obtained a meeting of the Peloponnesian
confederacy at Sparta, in which the conduct of the
conquest of Athens with regard to Corecyra and Potidæa
against the allies had brought their charges against
Athens, and after some Athenian envoys, who happened to
be in the city, had defended the conduct of their state, the
Spartans decided to exact all the tribute and wealth of
Athens had broken the truce, and they resolved upon imme-
diate war: king Archidamus alone recommended some
delay. In the interval necessary for preparation, an attempt
was made to throw the blame of commencing hostilities upon
Sparta, thus hoping to avoid all collision with demands of such a nature as could not be accepted.
In the assembly which was held at Athens to give a
final answer to these demands, Pericles, who was now at the
height of his power [PERICLES], urged the people to engage
in the war, and laid down a plan for the conduct of it,
advise the people to bring all their movable property from
the country into the city, to abandon Attica to the ravages
of the enemy, and not to suffer themselves to be provoked
and molested by independent parts, but to expend all
their strength upon their navies. Athens was then
employed in carrying the war into the enemies' territory, and
in collecting supplies from the subject states; and further,
not to attempt any new conquest while the war lasted.
His advice was not adopted by the Spartans, who, after
a refusal of their demands, but with an offer to refer
the matters in dispute to an impartial tribunal, an offer
which the Lacedaemonians had no intention of accepting.
After this the usual peaceful intercourse between the rival
states was discontinued.

Thucydides (ii. 1) dates the beginning of the war from
the early spring of the year 431 B.C., the fifteenth of the
thirty years' truce, when a party of Thespians made an
attempt, which at first succeeded, but was ultimately
defeated, to surprise Plataea, in which true and false
parties addressed themselves to the war. The Pelopon-
nesian confederacy included all the states of Pelopon-
nesus, except Achaea (which joined them afterwards) and
Argos, and without the Peloponnesus, Megaris, Phocis,
Locris, Euboea, Boeotia, Phocis, Tellus, Phthia, Oeniadae,
Parnassus, and the whole of Attica. The allies of the Athenians were
Chios and Lesbos, besides Samos and the other islands of
the Ægean which had been reduced to subjectation [Thera
and Melos, which were still independent, remained neutral].
Phlegra, the Messenian colony in Naupactus, the major
of the Acrarnans, Corecyra, Zacynthus, and the Greek
colonies in Asia Minor, in Thrace, and Macedonia, and on
the Hellespont. The resources of Sparta lay chiefly in her
independence and the occasional assistance of Argos and
the allies, whose period of service was limited; the
Spartans were also deficient in money. The Athenian strength lay in
their fleet, which was manned chiefly by foreign sailors,
whom the wealth that they collected from their allies enabled
them to pay.

Thucydides informs us that the cause of the Lacedaemonians
was the more popular, as they professed to be deliverers of
Greece, while the Athenians were fighting in defence of an
empire which had become odious through their tyranny,
and to which the states which yet retained their indepen-
dence feared to be brought into subjection.

In the summer of the year 431 B.C., the Peloponnesians
invaded Attica under the command of Archidamus, king of
Sparta. Their progress was slow, as Archidamus, their
commander, seemed to have no strong military
conceptions, which could be done by intimidating the Athenians before pro-
ceding to extremities. Yet their presence was found to be
a greater calamity than the people had anticipated; and
when Archidamus made his appearance at Achaia, they
fled to the Peloponnesus; and towards the autumn Pericles led
the whole disposable force of the city into Megaris, which
he laid waste. In the same summer the Athenians
expelled the inhabitants of Ægina from their island,
which they colonised with Athenian settlers. In the
winter there was a public funeral at Athens for those who
had fallen in the war, and Pericles pronounced over them.
In the following summer (B.C. 430) the Peloponnesians again invaded Attica under Archidamus, who now entirely and singularly led scarcely a corner of the land un ravaged. This invasion lasted forty days. In the meantime a grievous pestilence broke out in Athens, and raged with the more virulence on account of the crowded state of the city. This turned the Athenians, who himself was a sufferer, to the right and left a minute and apparently faithful description (ii. 46, &c.).

The murmurs of the people against Pericles were renewed, and he was compelled to call an assembly to defend his policy. The soldiers also, who had been made to the Lacedaemonians, but he himself was fined, though immediately afterwards he was re elected general. While the Peloponnesians were in Attica, Pericles led a fleet to ravage the coasts of Peloponnesus. In the winter, the Athenians had concluded terms favourable terms. (Thucyd. i. 70.)

The next year (B.C. 429), instead of invading Attica, the Peloponnesians laid siege to Platea. The brave resistance of the inhabitants forced their enemies to convert the siege into an investment. An attempt was made by the Ambracians and a body of Peloponnesian troops to repulse them, and a large Peloponnesian fleet, which was to have joined in the attack on Aesarina, was twice defeated by Phormion in the mouth of the Corinthian Gulf. An expedition to invade Thessaly and the revolting Central Greek towns was defeated with great loss.

In the preceding year (B.C. 430) the Athenians had concluded an alliance with Sicyeis, king of the Odyrsm, in Thrace, and Persian ships, which occasional movements of their fleet were to aid the Athenians to subdue their revolted subjects in Chalcidice. He now collected an army of 150,000 men, with which he first invaded Macedonia, to revenge the breach of certain promises which Pherdocia had made to him, and afterwards to invade that of the Chalcidice and Bottimia, but he did not attempt to reduce any of the Greek cities. About the middle of this year Pericles died.

The invasion of Attica was repeated in the next summer (429 B.C.), and afterwards for several years, forcing the Athenians to evacuate the Lacedaemonians, who laid siege to Mytilene. The Mytileneans begged aid from Sparta, which was promised, and they were admitted into the Spartan alliance. In the same winter a body of the Plateans, amounting to 20,000 men, sailed home, and took refuge in Athens.

In the summer of 427 the Peloponnesians again invaded Attica, while they sent a fleet of forty-two galleys, under Alees, to the relief of Mytilene. Before the fleet arrived Mytilene was taken, the galleys were destroyed, and the settlers, having been massacred, and the city burnt to the ground.

The land of the Lesbians (except those of Methymna) was seized, and divided among Athenian citizens, to whom the inhabitants paid a rent for the occupation of their former property. In the same summer the Plataians surrendered; those who were spared were massacred, and their city was given up to the Thebans, who razed it to the ground.

In the year 426 the Lacedaemonians were deterred from invading Attica by earthquakes. An expedition against Argos was began, but Pericles, who was there, was completely defeated; but afterwards Demosthenes and the Aesarinians routed the Ambracians, who nearly all perished. In the winter (425-424) the Athenians purified the island of Delos, as an acknowledgement to Apollo for the cessation of the war.

At the beginning of the summer of 423 the Peloponnesians invaded Attica for the fifth time. At the same time the Athenians, who had long directed their thoughts towards Sicily, sent a fleet to aid the Lemnians in a war with Syracuse. Demosthenes accompanied this fleet in order to set as occasion might occur on the coast of Peloponnesus. He fortified Pylus on the coast of Messenia, the northern headland of the modern bay of Navarino. In the course of the operations which were undertaken to dislodge but the Lacedaemonians, got blockaded in the island of Sphacteria at the mouth of the bay, and were ultimately taken prisoners by Cleon and Demosthenes. (Cleon.) Pylus was garrisoned by a colony of Messenians, in order to annoy the Spartans. After this event the Athenians engaged in vigorous offensive operations, of which the most important was the capture of the island of Cythera by Niclas, early in B.C. 424.

This summer however the Athenians suffered some reverses in Bucotia, where they lost the battle of Delium, and on the coast of Cenea, where they were defeated by a force among other exploits took Amphipolis. (Brakef. Thucyd.)

The Athenian expedition to Sicily was abandoned, after some operations of no great importance, in consequence of a general pacification of the island, which was effected with the influence of Hormoctor, a citizen of Syracus.

In the year 423, a year's truce was concluded between Sparta and Athens, with a view to a lasting peace. Hostilities were renewed in 422, and Cleon was sent to cope with the Syracusans, who had proceeded with great force against Megara, in which they had a large garrison. Sparta and Athens immediately after the peace; and intrigues were commenced for the formation of a new confederacy with Argos as the head. An attempt was made to draw Sparta into alliance with Argos by the aid of a similar overture subsequently made to Athens with better success, chiefly through an artifice of Alcibiades, who was at the head of a large party hostile to the peace, and the Athenians concluded a treaty offensive and defensive with Argos, this being the first treaty for centuries, but on the year 421 the Argive confederacy was broken up by their defeat at the battle of Mantinea, and a peace, and soon after an alliance, was made between Sparta and Argos. In the year 421 an expedition was undertaken by the Athenians against Thessaly, and afterwards into Macedonia, and the Macedonians surrendered at discretion: all the males who had conspired were put to death; the men and children were made slaves; and subsequently five hundred Athenian colonists were sent to occupy the island. (Thucyd. i. 716.)

The five years' truce was nullified, and though its terms had been broken on both sides, till the year 415, when the Athenians undertook their disastrous expedition to Sicily. (Alcibiades, Syracuse.) After the failure of that expedition (B.C. 413), the war became on the part of Athens a struggle for existence, but on the part of Persia, put forth energies which might have saved her, but for her own infatuation and the gold which her enemies obtained from Persia. The events of the war, from this period to the battle of Naxos (B.C. 407), have been related under the name of the Sacred War of the Athenians, and those who have been helped in his assistance, and completely defeated the Spartans in the battle of Arginusae. The Spartans now made overtures for peace, which were rejected by the Athenians at the instigation of a demagogue and tyrant, Lycurgus.

In the following year (B.C. 406) Lycurgus was appointed to the command of the Lacedaemonian fleet. (Lycurgus.) He attacked the Athenians at Egospotheni on the Hellespont at a moment when they were off their guard, and literally destroyed their fleet. This blow in effect finished the war. Lycurgus sailed to Athens, without receiving the submission of the allies, and blockaded the city, which surrendered after a few months (B.C. 404), on terms dictated by Sparta with a view of making Athens a useful ally by giving the ascendency in the state to the oligarchical party. (Ath. pol.)
The history of the Peloponnesian War was written by Thucydides, upon whose accuracy and impartiality, as far as his narrative goes, we may place the fullest dependence. His history ends abruptly in the year 411 B.C. For the rest of the war we have to follow Xenophon and Diodorus.

The value of Xenophon's history is impaired by his prejudices, and that of Diodorus by his carelessness.

PELOPONNESUS (θηλοπόννεσ) is, that is, the island of Peloponnese, and considerates its name from Pelops, who is said by later Greek mythologists to have been of Phrygian origin. Thucydides (i. 9) simply observes that he came from Asia, and brought great wealth with him. Heraclea, the daughter of Sthenelus, king of Pass in Elis, married him to his king, in order to have subsequently extended his dominions over many of the districts bordering upon Elis, whose whole country obtained the name of Peloponnesus. Agamemnon and Menelaus are mentioned in Homer.

The word Peloponnesus does not occur in Homer. The original name of the peninsula appears to have been Apia (Hom. Il, i. 270: iii. 49), and was so called, according to Echylus (Suppl., 266), from Apis, a son of Apollo, or, according to Pausanius (vii. 5, § 9), from Apis, a son of Telekh and descendant of Egateus.

When Argos had the supremacy, the peninsula, according to Strabo (viii. 371), was sometimes called Argos; and indeed Homer seems to use the term Argos in some cases as including the whole peninsula.

Herodotus reckoned (viii. 73) Peloponnesus to contain seven different tribes, the Arcadians, Cyrenii, Achaeans, Doriacs, Ionians, Dryopes, and Lemnians; the four last of which tribes, he says, had migrated from other countries, but had been released at that time, however, from the traditions in Herodotus, Strabo, and Pausanias, that the Achaeans were immigrants. (Achaeans.)

In the time of Thucydides (i. 10) the Peloponnesus appears to have been divided into five parts, namely, Laconica, Messenia, Argolis, Achaea, and Arcadia; but in that case, as Pausanias has remarked (v. 1, § 15), Elis, which for many reasons ought to be made a separate division, must have been included in Achaea or Arcadia. Pausanias treated of Elis before all, because it was the most celebrated of all the states of Greece, which includes Corinthia and Argolis. Laconica, Messenia, Elis, Arcadia, and Arcolis, and Messenia, to which Sicyponia or Corinthia is sometimes added.

The ancient history of Peloponnesus forms part of the history of Greece. (Greek and the references there given.) The physical geography of the country is given under Moera, Achaea, Arcadia, Argos, Elis, Laconica, and Neorthia. (Neorthia.)

PELOPS. (Peloponnesus.)

PELO/RIS. Polis's name for the animal of the Oysters, properly so called, Ostrea. (Pectenidae.)

PELORANTA. Oken's name for a form of Neris, Nerita, Numa, or other sea snail, which were published by his friend Dr. James Wilson in 1771. London, 8vo. At a later period he was requested by the College of Physicians, of which he was early elected a fellow, to remodel their Pharmacopoeia of which, in an improved form, he published a translation in 1746, London, 8vo. He died 9th April, 1771.

Although, chemistry, and medicine had been his chief objects of study, there were probably few departments of science in which he did not possess more than ordinary knowledge. This was particularly the case in the mathematics and astronomy, with which his writings show that he had been familiar. It is to his own translation of Newton's 'Principia' which appeared in 1726, he published,—1. 'Epistola a Alium de Cotesi Inventis,' London, 1722, 4to; 2. 'View of Sir Isaac Newton's Philosophy,' London, 1711, 8vo; 3. 'Law of the Physical World,' London, 1733, 8vo. His communications to the Transactions of the Royal Society, of which body he was admitted a fellow, 8th December, 1720, extend from vol. 32 to vol. 62, and among them may be noticed, 1. Remarks on an Experiment of Mr. Black's, respecting the falsity of the common opinion respecting the force of bodies in motion, 1723; 2. 'On the Locus for three and four lines, celebrated among the ancient Geometors,' 1763; 3. 'Keppler's Method of computing the Moon's Parallaxes in Solar Equations,' 1711, 4. 'Geometrical Solutions of three celebrated Astronomical Problems,' 1772, &c. Among the MSS. found by his executors were,—1. 'History of Trigonometry,' 1763; 2. 'Comment on Newton's Principia,' 1775; 3. 'Treatise on Spheres and Spherical Proportions,' 1711. 'Principles of Archimedes,' 3. 'Principles of Mercurio's and Middle Latitude Sailing,' and some others enumerated in Dr. Hutton's 'Dictionary.' His library contained a choice collection of mathematical works, a large proportion of which was published in London, 1742, 4to, and which took place during his stay in Paris. The whole of them, together with those of his friend Dr. Wilson, were sold by auction soon after his death. The number of lots was 505, and the gross proceeds 701L 17s. 6d. (See Caledonian Magazine, vol. 131, for a list of each lot annexed, in the library of the British Museum.)


PEMBROKE COLLEGE, OXFORD, was founded in the early part of the seventeenth century, on the site of Broadgate Hall, an ancient seminary for students of the civil and canon law. It originally belonged to the priory of St. Frideswide, and is believed to have been the place where the novices of that house received their first education. It was long known by the name of Segrave Hall, or of Segrave Surl. It afterwards received the name of Broadgate, from the width of its entrance. It was one of the purchases which Wolsey attached to his intended college, and the dissolution was returned to Oxford by King Henry VIII. its rent being then valued at about one hundred and thirty shillings and four pence. Dr. John Budden, the last principal of Broadgate Hall, died in 1620.

The new foundation took place a few years after this, in consequence of the special and exclusive donation of the estate of Sir John Glypton in Oxfordshire. Mr. Tisdale, having bequeathed 5000l. to purchase estates for the maintenance of certain fellows and scholars from the free-school of Abingdon in any of the colleges of Oxford, Mr. Abbot, archbishop of Canterbury, and the other trustees, having purchased the site of Broadgate Hall, and in the meantime estates were purchased for the endowment in Berkshire and Wiltshire. The plan was now assisted by a second benefactor, Richard Pembroke, B.D., chancellor of the college, and afterwards rector of East Ilsley in Berkshire, who engaged to make over some estates in aid of the endowment.

The corporation of Abingdon next petitioned the king that he would constitute a college within Broadgate Hall, which was accordingly done by letters patent dated 22nd February, 1624, the said college to be known by the name of Thomas Tisdale, fellows, and scholars of the college of Pembroke, from the university of Oxford, of the foundation of King James, at the cost and charges of Thomas Tisdale and Richard Wightwick. It received the name of Pembroke from William Herbert, earl of Pembroke, then chancellor of the university, whose interest was liberally employed in its establishment; and it
consisted of ten fellows and scholars besides the master.

Four of the fellows of Tedsale's foundation are to be chosen from his relatives; two of Wightwick's must be either related to him or bear the same name. The feast are elected from the free-school at Abingdon.

One fellowship, to be held by a native of Jersey or Guernsey, was founded by King Charles I., in 1636. Sir John Benet, K.B., afterwards Lord Ossulstone, endowed two fellowships, a master's and a scholar's, and the latter he bequeathed to which all members of the college and others are eligible who are not already on some foundation; and Sir John Philips, Bart., founded one fellowship and one scholarship in 1749. Several scholarships and exhibitions have also been added to the college by bequests and donations, the total number consists of a master, fourteen fellows, and twenty-nine scholars and exhibitioners. The total number of members whose names are on the books of the college is a hundred and eighty.

The positions in the patronage of this college are, the rectories of Stifford in Essex, Coln St. Dennis in Gloucestershire, Sibson in Leicestershire, St. Aldates in Oxford, Kingshill in Suffolk, and Brinkworth, Coftford St. Peter and Lyddiard Millicent, in Wilts, with the vicarage of Tuffley in Gloucester. Next, the church of St. Michael in Berks, and Uxbridge in Middlesex, and the curacies of West Haroldston and Lamberston in Pembroke-shire.

Among persons of note educated in this college are Edmund Bonner, bishop of London; Sir Thomas Brown, Chancery; Dr. Tatton, of Long, of the masters, an eminent astronomer; Stanley, editor of Stychus; and the late Right Hon. William Pitt.

Pembroke Hall, situated on the east side of Trumpington Street, consists of two courts of nearly the same dimensions, with the entrance on Havelock Street. One is about 42 feet by 27. On the east side of the inner court is a small detached building, erected for the purpose of containing a large hollow sphere, used as a lecture-room. The chapel was built by Matthew Wren, bishop of Ely, after design by his nephew Christopher Wren. It was dedicated in 1665.

A copy of the statutes of this college is preserved in the British Museum, in the Harleian MS. 734. The visitor is the queen. The number of members on the boards of the college is 24. The masters and professors are ranked by the length of their tenure: (Lysons') Magna Brit., Cambr., p. 105-167; Dyer's Hist. Coll. and Halls of Cambr.; Cambr. Univ. Calendar, 1849.

Pembroke-shire is a maritime county, forming the extreme south-east of the county, the sea coast by the counties of Carmarthen and Cardigan, on the other sides by St. George's and the Bristol channels. The length from St. David's Head to the borders of Carmarthenshire is 36 miles; from Stumble Head on the north coast to St. Gower's Head, the post, Dr. Less, the coast, is about 150 miles in circumference, with a very irregular coast-line above 100 miles in extent: it contains about 350 square miles, or 368,000 acres. The gross population in 1831 was 81,424, being an increase of 9 per cent. on the census of 1821. The county town, Haverfordwest, is 21 miles distant from London by the mail-coach road; and the bearing and distance in a direct line is west-half north 193 miles. In amount of population Pembroke-shire is the fourth of Welsh counties, and forty-first of England and Wales.

Surface; Coast; Rivers. Pembroke-shire has no very marked features. The surface is generally undulating, without any extensive plains, or mountains of very great elevation. Being surronded on three sides by the sea, and separated by the great estuary of Milford Haven, the course of the rivers is short, and there are consequently none of magnitude. The south-west winds are very injurious to the growth of timber, of which there is little except in sheltered valleys; the want of it gives a barren appearance to many parts of the country where timber grows. The Preseli mountains, a range running from near Fishguard to the borders of Carmarthenshire, are about 10 miles in length, and attain a height of 1734 feet above the sea. The Triffrid hills, on the south side of the Vale of Clwyd, the highest land in the southern part of Pembroke-shire, is 929 feet.

The river Teifi runs into the sea with a northerly course at the northern extreme of the county; the mouth is impeded by a dangerous bar. At Cilgerran and St. Dogmues is a village, where the inhabitants support themselves chiefly by fishing. Proceeding along the coast to the eastward for about 8 miles, is the town of Newport, once of considerable importance, but now decayed. Six miles farther, Fishguard stands on a bay formed by the estuary of the river Gwaun, which runs from east to west, with from 30 to 70 feet of water in good holding ground.
of sand and mud; it is open to the north-west, but is the only port of shelter on the west coast of Wales. In White- sands Bay in the south-west, mist, sleet, and snow descend on the ground. Off St. David's Head, 51° 54' N. lat., 5° 17' W. long., lies a cluster of small islets called the Bishop and his Clerks. The coast here turns to the southward, and shortly after forms the bay of St. Bride, about 8 miles broad and as many in depth, having two other harbours between it and small islands. There are two lighthouses on St. Anne's Head, at the north entrance of Milford Haven. This great estuary, called in Welsh Aber-da-Gleddau, or the mouth of the Gleddau, lies west of the southern part of Milford Haven. St. Anne's Head to the confluence of the East and West Cleddau; the mouth is about 2 miles wide, and it varies from that width to half a mile throughout. It contains numerous bays and creeks, completely landlocked, free from shoals and rocks, with excellent anchorage for ships from 5 fathoms upwards, and forms one of the finest harbours in the world. The southern coast presents a wild and inhospitable appearance: the Carboniferous limestone forms precipitous cliffs 100 feet high, without any port before we arrive at Tenby, a town which is situated near the south-east extremity of the county. The coast-line is extremely irregular, but the general bearing from the mouth of the Teifi to St. David's Head is west-south-west, from thence to St. Gowan's Head south-east, and from St. Gowan's Head north-east to Manorbier (true). Off St. David's Head lies Ramsey Island and the Bishop and his Clerks; off the southern point of St. Bride's Bay, the islands of Skomer, Skokholm, Grassholm; and 15 miles east, the tiny island of Puffin lying about 14 miles south from Tenby, and has a lighthouse on it. Pembroke-shire has no rivers of importance. The two rivers Cleddau or Cellyd are the principal: the eastern branch rises in the Pencelli mountains; the western in the river in the north, and is discovered in the St. Davids. The Tawe and Haverfordwest, from whence it is navigable for small vessels, and, uniting with the East Cleddau about 5 miles below that town, falls into Milford Haven. The other rivers are the Nevern, which empties itself into the bay of Newport, the Dulas, which flows into the sea at Carmarthen, and the Towy, which empties into St. Bride's Bay on the north side. The mail-coach road from London enters Pembroke-shire near Tavernspite. The mail arrives at Hobbs' Point, the station of the Irish steam-packet, at 12th. 34m. A.M., and at Pembroke Dock station at 11th. 29m. 20. A.R., quitting that town for London at noon, and Hobbs Point at 12th. 20m. The principal cross-roads are from St. David's through Fishguard and Newport to Cardigan, 32 miles; St. David's to Haverfordwest, 16 miles; Tenby to Pembroke Dock, 21 miles, and from the coal-mines at Kingsmoor to the sea at Saundersfoot. Climate.—The climate of the southern part of Pembroke-shire is mild, and not subject to great variations of temperature, but the atmosphere is frequently charged with saline exhalations from the sea, and occasioned by the exposure of the coast, is consequently damp. The higher or northern part of the county has a considerably lower temperature. Geology.—If a line be drawn through the centre of Pembroke-shire from east to west, we find the stratified rocks north of this line composed of slates, grit, and shales; to the south the older rocks are surmounted by the Silurian rocks, old red-sandstone, carboniferous limestone, and coal-measures. The whole surface is greatly diversified by trap-rocks bursting forth in many places, and altering the structure of the sedimentary deposits. The anthracite, stone-coal, or culm tract islets the country; it is a continuation of the great basin of South Wales, covering the whole coast of Carmarthen Bay. The northern edge, commencing near Tarbert at Llan biases in this tract, and is known as the Siebbach; then, with a westerly direction, by Harroldston St. Issela, where the older Silurian rocks wedge into it, to a quarter of a mile from the sea in St. Bride's Bay; it there widens, and runs north as far as Brawdy. The southern edge is entered in Pembroke-shire, which runs northward, crossing the Cleddy at Cleft: the band narrows to two miles south of Haverfordwest, and again spreads out towards St. Bride's Bay. The culm is contained in beds of shale and sandstone, overlying millstone-grit and carboniferous limestone, to a depth of 2 to 4 fathoms in thickness, and abound in dislocations and contortions. The fossil plants are the same as in other coalfields, Neuropteris gigantea, Pepotopus conchites, &c., together with various Lepidodendra and Calamites, which, from their fractured condition, are indeterminable. The millstone grit passes upwards into the coal, and downwards into the carboniferous limestone. It is generally a hard, compact rock, with many sandstone intercalations, and building and excellent for the roads. The Carboniferous limestone dips beneath the millstone-grit, forming a girdle round it in the eastern district, but disappearing in the west: a spur runs off from Carew, and terminates at Pembroke dockyard; from Pembroke dockyard to Pembroke Castle, and from here to the Castle Head on the south-east coast to West Angle Bay at the mouth of Milford Haven, where it is about a quarter of a mile wide. Pembroke stands upon this band. The coal-field of Pembroke-shire begins at Pembroke dockyard, and extends from Pembroke Point to St. Bride's Bay, and, from Stockpool on the east to near Castle Martin on the west, is of the same formation; and being bounded on three sides by the sea, presents a greater extent of Carboniferous limestone than is anywhere else laid open in Great Britain. The cliffs are about 150 feet high, almost everywhere abrupt, and full of fractures and contortions. There are frequent funnel-shaped cavities and fissures, to which the sea has access. Of these the most remarkable is Bosheston Mere. It is about 100 yards from the sea; and at times, when a heavy surf beats on the shore, reports by sound are heard, while it throws up jets of water forty or fifty feet. There are also many cairn-shaped hollows, which are filled with trees that could not bear upon the plain surface exposure to the south-west gales. Several species of fossil Spinifera and Terebratula are here found. From the mouth of the Stockpool enters Pembroke-shire near Tavershite; throwing out a promontory at Cylic, it girdles the carboniferous limestone, and tapering away, disappears opposite Siebbach. This is the only part of the tract which is not encompassed by the coal-field; all the others are to the south of it, supporting the carboniferous limestone in long ridges. It is generally of a red colour, though there are considerable tracts of grey and yellowish sandstone. No organic remains have been discovered in the Cambrian, nor is there any indication of the presence of cephalopods in the Carboniferous rocks. The forms of rocks of igneous origin protrude in many places. From Roche Castle near St. Bride's Bay, in a north-east direction, a ridge of trap, on the southern ridge of Highdown, on the eastern slope of Amblestoke, and appears again at intervals along the Pencelli range. Another ridge from Benton Castle, with an interruption from a narrow band of the upper Silurian rocks, supports the coal-field, is then covered by it, and reappears as a part of the sea-coast, continuing as far as Beacon, 327 feet, the highest ground in south Pembroke-shire, is on this ridge. The whole of the northern district is composed of rocks of the Cambrian system of Professor Sedgwick, interspersed with occasional traps. There is not one thin bed of the Cambrian, nor is there any fluvial or lacustrine deposits in Pembroke-shire. Between St. David's and Whitesand Bay, at the bays of Freshwater East and West, and near Stockpool promontory, there are considerable hills of blown sands, extending sometimes more than a mile inland, covering hills at heights of 130 feet above the strand, and containing a prodigious quantity of landshells, three or four species of Helices and Bulimis. These hills seem to have remained stationary. At Gunton Burrows, Newgale Sands, and St. Bride's Bay are two examples of forests submerged by the ocean, where, after severe storms, the sands being washed away, a stratum of clay and peaty earth appears, through which the stumps of trees are seen in a growing position. Copper-ore has been found in small quantities in the Carboniferous formation, but it is not sufficient to repay the cost of working. Slate-quarries are opened in the Pencelli mountains and near St. David's; the quality of the slates is inferior to those of North Wales. Coal is the only mineral besides slate which is worked in Pembroke-shire, and the description of the coal varies from stone-coal, the dust or smaller portion of which is known in commerce by the name of culm. The best coal and culm are raised at Landshipping, on the shore of Milford Haven. A coal-tram from a quantity of goods at Kingsmoor and Kilgetty, from whence it is conveyed by a railway to the sea at Saundersfoot, where a dock has been built. Soil; Agriculture. — The geological formations of this county present great variety; it follows that the soil in different quarters is exactly various. On the southern part
of the county, the limestone and old sandstone formations afford soils of excellent quality: some districts near St. David's, and along the coast towards Fishguard, are considered to be extremely well suited for the growth of barley; but in the coal district and the slaty ridge of the Preciell Mountains, the land is very inferior. The state of agriculture is as various as the soil: in the hundreds of Castle Martin and Roos, and part of Narberth, a better system prevails than in the upper or southern part of the district, although this is very far from being such as would be approved by a scientific agriculturist. Considerable advance has been made within the last few years, although a general want of capital among the farmers presents a great check. The cultivation of barley is more prevalent than wheat; known by the name of the Castle Martin breed, are bought in droves, for the supply of the London market principally, where they bear a tolerably good character. The breed of horseflesh is esteemed; they are rather small animals.

Leases for lives were formerly the most usual tenures. The farm buildings, from this reason, were, with the exception of certain properties, small, and in bad condition. The tenants grew crop after crop until the land was exhausted, and the arable was but an annuity on his own estate. A better system of leasing tenements now prevails, and few old leases are renewed. The farms vary in size from 30 acres to 800 and 1000, the great proportion being from 100 to 200 acres. The candidates for small farms being far more numerous than the farms for sale, the latter part of the former are higher in proportion. Farms in the good soils let from 11. to 13s. per acre; decreasing to 10s., 7s., and even 6s. The cottages are generally built with mud walls, a roof thatched roof, and a wattle and daub chimney. The cottages from the front of the cottage and near the one by the front door. Farm servants are kept in the house. Labourers live in their own cottages. The condition of the poor varies greatly: the poor-rates are very high at St. David's and Wiston, and very low at Tenby.

Dinehy. Pembroke shire is divided into seven hundreds, viz.:—

1. Narberth, to the South-East, 11,942 inhabitants.
2. Castle Martin, South, 5,024
3. Roos, 13,456
4. Dewisland, \[3,024\]
5. Kenysa, \[3,648\]
6. Kilgeran, \[4,181\]
7. Dungleelly, Centre, 7,639.

Tenby, the parliamentary parish of which three are partly in Carmarthenshire, and seven market towns. Three members are returned to parliament from Pembroke shire; one for the county, one for Pembroke, and one for the Haverfordwest district of boroughs.

Haverfordwest is the capital town of the district, situated on the West Cleddy, on the sides and at the bottom of very steep hills. Haverfordwest, with the contributory boroughs of Narberth, Fishguard, and St. David's, returns one member to parliament. The borough contained in 1831, 4139 inhabitants. By about 152 acres. 4 aldermen and 12 councillors. The vicarage of St. Mary's, in the gift of the corporation, has a net income of 131L.

The rector of St. Thomas, patron the Prince of Wales, 219L. The perpetual curacy of St. Martin's, 80L. Haverfordwest is principally occupied by shopkeepers, mechanics, and persons of moderate independent fortune, for whom the cheapness of the place is an attraction. House-rent is not low compared with other parts of Pembroke shire. Water is a good mechanical contrivance. Fish are caught from 148 to 200 a week. Coals are brought from Newport, Monmouthshire, and Liverpool. The houses poorer classes use the stone-coal broken small, and made into balls with clay. This fuel gives great heat, but has an unpleasant smell. The streets of Haverfordwest are paved, and the houses repairable, and the whole town contains many excellent residences. The river Cleddy is navigable at rising-tides to Haverfordwest, for vessels of 100 tons burden; at neaps, for little above 30 tons.

Fishguard, 16 miles from Haverfordwest, and a contributory borough, is increasing though slowly in size, but it is not very flourishing. It contains about 2000 inhabitants. The vicarage, in the patronage of the crown, is worth 111L. per annum. In the neighbourhood of the town, meadow-land lets at 4L an acre: in the rest of the parish the average is about 1L. The rent is high in the town, and varies from 1 to 3L. a year; the tenures are various, for life, for terms, and from year to year. Corn and butter are exported; coal, culm, limestone, and shop goods imported.

On the 20th February, 1797, a French force of about 1500 men landed here, who, after a few days' rioting and disorder, surrendered to 600 yeomanry and inhabitants hastily armed from Castle Martin, Narberth, and Haverfordwest, and 11 miles distant from that town, on the high road to London, has a population of 2589. It is ill-built and not paved, but is active, thriving, and increasing place, being the central post of a large district, which is supplied by it with shop goods. Fishguard is the only market town in the district, although the rents are high, and they are speedily occupied. The average size of farms in the neighbourhood is 30 acres. The rector of St. Andrew with the curacy of Robeston-Wathen is in the gift of the crown; the net income is 6L.

This valley, at the extreme west of the county, 1 mile from the sea, 16 miles from Haverfordwest, was once the seat of the bishops, but is now an incommoder village, with about 1000 inhabitants. The roads are very bad.

Pembroke lies in a rich country on a navigable creek of Milford Haven. The town consists of one long street, running east and west, and gradually ascending to the castle, which is situated on an abrupt rocky promontory at the south end of the creek, with Tenby, returns a member to parliament. By the Municipal Corporations Act, Pembroke is divided into two wards, the corporate body consisting of six aldermen and eight councillors. The parliamentary and municipal boundaries are coincident here and at Haverfordwest. The population in 1831 was 6511. The size of the farms in the agricultural part of the borough varies from 50 to 250 acres; there are a few of 400 acres. Leases are generally for lives. The three boroughs, St. David's, St. Michael, and St. Nicholas, are united for ecclesiastical purposes.

The pop. of Pembroke in 1831 was 6511. In the parish of St. Mary, about 2 miles from Pembroke, on the shore of Milford Haven, is situated the naval dockyard and arsenal, which was removed from Pembroke in 1810, and where a new establishment is being erected in the county; it occupies about 60 acres of land, and when the improvements contemplated and in progress shall be completed, it will be the finest building-yard in the kingdom, capable of having on the stocks at the same time the largest number of ships of the smallest size. The station of the Waterford corn-boats is at Hobbs's Point.

Tenby, a small seaport at the western extremity of Carmarthen Bay, 12 miles from Pembroke, and one of its chief boroughs, has 2432 inhabitants. There is little trade at Tenby: it is chiefly supported by its merits as a watering-place, for which it is well adapted both by the beauty of its scenery and the protection afforded by the neighbouring sands. Some of the Plymouth and Brixham fishing-boats make Tenby their station during the winter. The rector is in the gift of the Prince of Wales; net income 317L.

Milford, 13 miles from Pembroke, over the ferry by the usual route, is a pretty village, and the ferry very expensive—population about 4900.—Wiston, a populous town till the removal of the dockyard and packet establishment. The custom-house and quarantine establishments are situated here. Farms in the neighbourhood vary from 5 acres to 200 acres, and near the town lets at 4L an acre; at a distance, about 1L.

Wiston, with 745 inhabitants, contributes to the Pembroke district of boroughs: it is 8 miles direct from Pembroke, on the road is very circuitous; and 4 miles from Haverfordwest, and has a net income of 14L. There are farms here to small as 12 acres, and one as large as 320; they are chiefly let from year to year, one on lease for life, but none for term.
Mining Industry, Manufactures, and Commerce.—It has been already observed that coal and slate are the only minerals worked in Pembrokeshire. The mines of coal are situated on Milford Haven, and in the parishes of Bregelly and St. Issell's, from whence a railway has been constructed to connect the coalfields at Fishguard with Tenby and Tenby Bay, where a dock has been built.

Pembrokeshire has no manufactures worthy of notice. Some hats are manufactured at Narberth, and the cottagers work the coarse woollen fabric usually worn by the Welsh peasant.

The agricultural produce consists of coal, flax, and agricultural produce; the imports chiefly timber from Canada and ship goods from Bristol. The fisheries on the north coast were formerly valuable, but the herring have now almost disappeared. For soups the horse and salmon and shell-fish. The fishing-boats of St. Dogmael's are from 5 to 8 tons burthen, with from 6 to 8 men each.

Ecclesiastical Divisions.—Pembrokeshire is in the province of Canterbury, and the diocese of St. David's, and, with the exception of a few parishes in the northern part of the county belonging to the archdeaconry of Cardigan, in the archdeaconry of Caermarthenshire. There are 148 parishes, of which three are partly in Caermarthenshire, and 131 benefices, the average net income of which is about £154, the highest being £492; there are only three exceeding 400l. per annum.

The Crown, as Prince of Wales, appoints:—

The Bishop:—

Chapter, Corporations, and Universities:—

Parochial:—

No report from:—

40
13
18

2—131

Assizes are held in spring and summer at Haverfordwest, and quarter-sessions four times a year at the same place.

Obiter Dictum of Henry I. It is of Norman architecture mixed with early Gothic. The principal tower remains perfect. During the civil wars of Charles I. this castle made a gallant defence for the crown, under Colonels Langhorne and Powell; it was taken and dismantled by Cromwell, in 1648. Under William and Mary it was largely restored, and was let out for about 80 feet by 60. Henry VII. was born in this castle.

Manoebour Castle, near Tenby, is an extensive ruin, whose massy remains prove it to have been formerly a place of importance; it was founded by the family of Barri, of which Sir Ludlow Sylvestre, surnamed Cambrensis, was a member. He was born here, and the church contains a sepulchral effigy of him. Near St. Gowan's Head is a cell cut in the face of the steep cliff, inaccessible except by a flight of steps. Here St. Gowan lived, and performed miraculous cures. Lambs and blind pigeons are still conveyed hither by their friends, anointed with a poultice of the clay formed by the decomposition of the limestone, and left there to bask in the sun. It is also frequently a wishing-place; the wish, if the ceremony be performed with the ceremony prescribed, is certain of having his wish fulfilled within the year. At Lamphey, or Llanfyl, near Pembroke, are the remains of a former palace of the bishops, alienated to Henry VIII., and by him granted to Walter Devereux, afterwards Viscount Hereford.

Cilgwyn Castle, on the Teivi, was built by Marshall, earl of Strigal (Chepstow), after he had conquered Gryffydd, prince of Wales, in 1223. Near the mouth of the same river are the remains of the monastery of St. Dogmael, founded by St. Martin of Tours, who converted the land of Kennes, in the reign of William I.; it was endowed and made an abbey in the time of Henry I., and dedicated to it St. Mary. The island of Caldy belonged to St. Dogmael's.

Penston Castle, at St. David's, is a fortified residence of the Clegdds, was built in the reign of William Rufus. A preceptory of the knights of St. John of Jerusalem was established at Siebech before 1301. Pili Priory was founded by Adam de Rupe, in 1200, of the strict order of Benedictines, called Tyron. Here St. Gower lived, and performed miraculous cures. The church was formed of a single stone, two feet broad, eighteen inches thick, and thirteen feet high, richly decorated. Near Pontre-Evan, in the same parish, is a cromlech, probably one of the largest in the kingdom. There are several Druidical remains in the neighbourhood of Nevenn, and Nevenn is a very venerable pile, and one of the largest in the county. Besides the remains enumerated are the castles of Carew, Narberth, Haverfordwest, Banton, Llaihen- den, Newport, Roch, Tenby, castles in Pulter Bay near Pembroke, the priory and bridge of Haverfordwest, Llanfih Tor, &c.

**Statistics.**

**Population.**—According to the census of 1831, of 18,136 males twenty years of age and upwards, 1,599 were labourers engaged in non-agricultural employments; 1,647 males aged twenty and upwards were employed in agriculture, of whom 1,675 were labourers; 1,942 were occupiers of land employing labourers; and 1,864 occupiers not employing labourers. The number employed in manufactures or in making machinery was 1,301. There were about 3,430 weavers of woolen cloth and flannel in the county, but the largest number at any one place was no more than 17, at St. David's. The mines and quarries afforded employment to a considerable number of labourers, and 324 males aged twenty years and upwards were employed as shipwrights and boat-builders.

The population of Pembrokeshire, at each of the four following periods, was:—

<table>
<thead>
<tr>
<th>Year</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1801</td>
<td>25,406</td>
<td>30,874</td>
<td>56,280</td>
</tr>
<tr>
<td>1811</td>
<td>27,423</td>
<td>33,162</td>
<td>60,585</td>
</tr>
<tr>
<td>1821</td>
<td>34,350</td>
<td>39,479</td>
<td>73,829</td>
</tr>
<tr>
<td>1831</td>
<td>37,952</td>
<td>43,473</td>
<td>81,425</td>
</tr>
</tbody>
</table>

and showing an increase between the last and periods of 21,415, or rather more than 44 per cent. on the whole population, being 5 per cent. above the rate of increase for the whole of Wales.

The following table exhibits a summary of the population of every hundred, &c., as taken in 1831:—

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Castle-Martin (Hundred)</td>
<td>834</td>
<td>906</td>
<td>627</td>
<td>1,449</td>
<td>372</td>
</tr>
<tr>
<td>Downland</td>
<td>2,109</td>
<td>2,356</td>
<td>144</td>
<td>858</td>
<td>179</td>
</tr>
<tr>
<td>Dunchleldy</td>
<td>1,064</td>
<td>1,069</td>
<td>134</td>
<td>1,076</td>
<td>612</td>
</tr>
<tr>
<td>Kemess</td>
<td>3,136</td>
<td>3,244</td>
<td>412</td>
<td>1,210</td>
<td>637</td>
</tr>
<tr>
<td>Kilgarran</td>
<td>973</td>
<td>990</td>
<td>18</td>
<td>589</td>
<td>300</td>
</tr>
<tr>
<td>Narberth</td>
<td>2,343</td>
<td>2,486</td>
<td>96</td>
<td>1,102</td>
<td>357</td>
</tr>
<tr>
<td>Rose</td>
<td>1,667</td>
<td>1,773</td>
<td>396</td>
<td>1,592</td>
<td>612</td>
</tr>
<tr>
<td>Haverfordwest (Town)</td>
<td>748</td>
<td>805</td>
<td>24</td>
<td>10</td>
<td>314</td>
</tr>
<tr>
<td>Pembroke (Borough)</td>
<td>1,079</td>
<td>1,233</td>
<td>20</td>
<td>121</td>
<td>96</td>
</tr>
<tr>
<td>Tenby (Town)</td>
<td>362</td>
<td>479</td>
<td>7</td>
<td>32</td>
<td>355</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>15,779</td>
<td>16,595</td>
<td>144</td>
<td>7,574</td>
<td>4,519</td>
</tr>
</tbody>
</table>

**County Expenses, Crime, &c.—The sums expended for the relief of the poor, at the following dates, were—**

<table>
<thead>
<tr>
<th>Year</th>
<th>£</th>
<th>s.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1811</td>
<td>20,390</td>
<td>6</td>
</tr>
<tr>
<td>1821</td>
<td>20,245</td>
<td>5</td>
</tr>
<tr>
<td>1831</td>
<td>24,532</td>
<td>5</td>
</tr>
</tbody>
</table>

The expenditure in each of the following years was as under:—

<table>
<thead>
<tr>
<th>Year</th>
<th>£</th>
<th>s.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1833</td>
<td>23,119</td>
<td>12,360</td>
</tr>
<tr>
<td>1834</td>
<td>22,580</td>
<td>21,833</td>
</tr>
<tr>
<td>1835</td>
<td>21,576</td>
<td></td>
</tr>
</tbody>
</table>

In the 1837-8 the number of each head of the population, according to the census of 1831, was 52 4d.; but assuming the population had increased 7 6d. per cent. from 1831 to 1838, the average for each inhabitant, instead of being 52 4d., will be 4s. 11d. The sum raised in this county for poor-rate, county-rate, and other local purposes, in 1835, was 30,616l., levied upon the following descriptions of property:—

<table>
<thead>
<tr>
<th>Description of Property</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>On land</td>
<td>27,072</td>
</tr>
<tr>
<td>Dwelling-houses</td>
<td>3,284</td>
</tr>
<tr>
<td>Mills, factories, &amp;c.</td>
<td>166</td>
</tr>
<tr>
<td>Manorial profits, navigation, &amp;c.</td>
<td>93</td>
</tr>
</tbody>
</table>

Total £30,616

Under the property tax Pembrokeshire was assessed, in 1815, at 220,291l., namely, property from lands 181,057l., houses 20,064l., tithes 13,290l., profit from manors 31l., profits of quarries 60l., profits of mines 310l. The annual profits of trade were assessed at 43,102l.

The county expenditure for the year ending 25th March, 1838, amounted to 26,576l., namely—

<table>
<thead>
<tr>
<th>Description of Expenditure</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relief and maintenance of the poor</td>
<td>21,576</td>
</tr>
<tr>
<td>Removal of paupers, law charges</td>
<td>527</td>
</tr>
<tr>
<td>Payment towards county-rate</td>
<td>3,106</td>
</tr>
<tr>
<td>Fees to clergymen and registrars under Registration Act</td>
<td>128</td>
</tr>
<tr>
<td>Outlay for register-offices, books, &amp;c., under ditto</td>
<td>93</td>
</tr>
<tr>
<td>Payments under Parochial Assessments Act</td>
<td>88</td>
</tr>
<tr>
<td>For all other purposes</td>
<td>958</td>
</tr>
</tbody>
</table>

Total £26,576

There are three unions in Pembrokeshire, under the Poor Law Amendment Act, namely—

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Haverfordwest</td>
<td>63</td>
<td>33,333</td>
<td>11,211</td>
<td>91,296</td>
</tr>
<tr>
<td>Narberth</td>
<td>51</td>
<td>21,902</td>
<td>65,865</td>
<td>5,595</td>
</tr>
<tr>
<td>Pembroke</td>
<td>21</td>
<td>17,191</td>
<td>5,424</td>
<td>5,416</td>
</tr>
</tbody>
</table>

In 1836 the number of bastard children chargeable to the poor-rate in the county was 863, or one in 94 of the population, according to the census of 1831; the average for Wales being one in 139, and for England one in 213. At the same period 95 lunatics and idiots were chargeable to the poor-rate, or one in 527 of the population; the proportion for Wales being one in 807, and for England one in 1035.

The number of turnpike-trusts in the county in 1824 was four, having 173 miles of road under their charge. The income from tolls in 1832 was 166,527l., and the total income amounted to 293,60l., including 110,458l. borrowed on security of the tolls. The expenditure amounted to 325l. The debts of the trustees were 19,273l., consisting of 13,49l. bonded or mortgage debts; 364l. unpaid interest; and the remainder of the balance of small sums due to the treasurers.

The number of persons charged with criminal offences, and committed, in the three septennial periods ending 1820, 1827, and 1834, were 179, 180, and 175, making an average of 185 annually in the first period, 21 in the second, and 25 in the third. In each of the following years the numbers committed, convicted, and acquitted were respectively as follows:—

<table>
<thead>
<tr>
<th>Year</th>
<th>£</th>
<th>s.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1835</td>
<td>106</td>
<td>10</td>
</tr>
<tr>
<td>1836</td>
<td>197</td>
<td>5</td>
</tr>
<tr>
<td>1837</td>
<td>197</td>
<td>10</td>
</tr>
</tbody>
</table>

Committed | 39 | 67 | 54 |
Convicted | 20 | 35 | 25 |
Acquitted | 18 | 32 | 26 |

Of the 45 persons committed in 1838 the number of males was 26, females 20; and 16 of the former and 8 of the latter were between 21 and 30 years of age; only 2, 21 females, were under 16. There were 10 of the males and 3 females who could neither read nor write; 13 males and 2
females could read and write imperfectly; 3 males could read and write well; and the state of instruction of the remaining 3 was not ascertained. None of the alleged offences were of an envious or malicious nature; 6 were offences against the person, 7 offences against property attended with violence, 27 offences against property unaccompanied by violence, 23 being cases of simple larceny, and the remaining 6 were other offences of a light character. Of the 20 persons convicted, 17 were imprisoned for various periods of six months and under; 3 for above six months and under one year; and 1 was transported for 15 years. Of the 26 acquitted, 17 were found not guilty on trial; in the case of 8 no bill was found; and in one case there was no prosecution.

The number of persons registered to vote for the county members, in 1834-5, was 3664; in 1835-6 there was an increase of 202, the number of persons qualified being 3866. In 1835 there were legal persons in the county qualified to serve on juries under 6 Geo. IV., c. 50.

There are only two savings-banks in the county. The number of depositors and amount of deposit in each of the following years was as under:

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of depositors</th>
<th>Amount of deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1833</td>
<td>1329</td>
<td>41,927L</td>
</tr>
<tr>
<td>1834</td>
<td>1362</td>
<td>45,107L</td>
</tr>
<tr>
<td>1835</td>
<td>1417</td>
<td>48,047L</td>
</tr>
</tbody>
</table>

Education.—According to the Charity Reports, the income of endowed schools in the county is 412L, and the sum of 38L is applicable to purposes of education in schools not endowed. The following summary is taken from the third volume of the Education Inquiry made in 1833 on the motion of the late Earl of Kerry:

<table>
<thead>
<tr>
<th>Education Inquiry</th>
<th>Schools</th>
<th>Scholars</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infantschools</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of children at such schools; ages from 2 to 7 years:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex not specified</td>
<td>131</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily schools</td>
<td>193</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of children at such schools; ages from 4 to 14 years:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>1,974</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>1,367</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex not specified</td>
<td>2,832</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schools</td>
<td>136</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total of children under daily instruction</td>
<td>201</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunday schools</td>
<td>145</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of children at such schools; ages from 4 to 15 years:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>2,693</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>2,584</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex not specified</td>
<td>5,859</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>11,135</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Eighteen Sunday-schools are returned from places where no other school exists, and the children who are instructed therein (1229 in number) cannot be supposed to attend any other school: at all other places Sunday-school children have opportunity of resorting to other schools also, but in what number, or in what proportion duplicate entry of the same children is thus produced, does not appear. Twelve schools, containing 719 children, which are both daily and Sunday-schools, are returned from various places, and duplicate entry is therefore known to have been thus far created. In some of the Sunday-schools, adults and aged persons as well as children attend; and two Sunday-schools are mentioned where some are said to attend at eighty years of age.

**Maintenance of Schools.**

<table>
<thead>
<tr>
<th>Description of Schools</th>
<th>By endowment</th>
<th>By subscription</th>
<th>By donations</th>
<th>By receipts</th>
<th>By per-</th>
<th>From scholars</th>
<th>Amount from scholars or per from scholars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infantschools</td>
<td>19</td>
<td>659</td>
<td>731</td>
<td>185</td>
<td>214</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Daily-schools</td>
<td>4</td>
<td>555</td>
<td>615</td>
<td>622</td>
<td>592</td>
<td>2</td>
<td>209</td>
</tr>
<tr>
<td>Sunday-schools</td>
<td>91</td>
<td>602</td>
<td>731</td>
<td>223</td>
<td>1,735</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>1,248</td>
<td>1,589</td>
<td>1,210</td>
<td>2,952</td>
<td>14</td>
<td>940</td>
</tr>
</tbody>
</table>

The schools established by Dissenters, included in the above statement, are—

**Scholars.**

<table>
<thead>
<tr>
<th>Scholarships</th>
<th>Containing</th>
<th>Daily-schools</th>
<th>Sunday-schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>16</td>
<td>362</td>
<td></td>
</tr>
<tr>
<td>9,241</td>
<td></td>
<td>2,237</td>
<td></td>
</tr>
</tbody>
</table>

Seven boarding-schools are included in the number of daily schools given above. All religious denominations, including the Established Church, disclaim the fact of education being confined in any of the schools in the county to children whose parents are members of their respective denominations.

Lending libraries of books are attached to 4 schools in this county.

**PEN**

**PE'MPHIGUS** is a disease of the skin, consisting of the eruption of one or more rather large blisters, containing serous fluid, and terminating either in thin scales, in superficial excoriations, or in ulceration. The common and most acute form of Pemphigus is usually preceded by shivering, and accompanied by slight feverishness; the eruption appears on some part of the body from one to four days after the beginning of the illness, with a prickling sensation and bright redness of the part affected. Within 24 hours afterwards the blisters begin to rise, and increase in size till they become very much larger as they burst, but do not always burst, sometimes smaller. They then, after two or three days, burst, and leave the skin raw and painful. A thin scab usually forms over the exposed skin, and after a few days more, drops off and leaves it healthy, but redder, and with a thin scabulous crust. The treatment should consist of gentle purgatives, and cooling medicines and diet; the local applications, if any, should be mild dressings, merely for the purpose of defending the raw surfaces from the air and injury. The disease will thus usually run its course to spontaneous recovery.

A more obstinate form is the chronic pemphigus, which occurs in old or very debilitated persons. The blisters appear one after the other, through an indefinite length of time, some breaking out while others are healing or ulcerating or even sloughing. They are so commonly accompanied by the complaints of other more serious disorders, that the local affections of the skin in these cases are seldom the objects of peculiar treatment; if the condition of debility on which they are grafted can be relieved, they also will soon disappear.

A third form is that termed infantile or gangrenous pemphigus. It is entirely confined to children and especially affects those who are less than five years old. It occurs sometimes as an epizootic, and is very common among the children of the poor in Ireland, where it is known under the name of white blisters, burnt-holes, eating-hive, &c. The blisters in this form are usually succeeded by deep ulcers, which enlarge rapidly and discharge profusely, and leave dark livid edges and a remarkable desquamation. The condition at the same time becomes emaciated and weak, and often about the eighth day of the disease sinks into a state of debility which soon terminates fatally. All the usual modes of treatment being found useless, Dr. Stokes, by whom this form of the disease has been particularly described, sought-out a remedy which had been commonly used with success by an empiric, and found it to be the juice of the great igwort (Scrophularia nodosa), which was made up into an ointment. He has since used this with considerable success. The swollen and ulcerating parts having been previously poulticed, the ointment should be molten, and applied over them very gently with a soft feather. This ointment is prepared by stirring the young leaves of the Scrophularia in a small quantity of unboiled milk till it acquires a full grass-green colour. It is of considerable utility in many diseases of the skin besides that for which it was first employed. In pemphigus its use should be combined with nutritious diet and tonics.
divided into three or four lengths each, and the end of each length is made into a pen by a small machine, which at one stroke makes the slit and cuts the shoulders; they are then finished by being nibbed by hand. Small pocket machines may be bought at the cutler's for making pens on the same principle as that used in the manufacture of the nibs; but they are expensive, and require careful usage; or, they soon get out of order.

The nibs were used for German text, old English, ingrossing, and other black hands, as they are called, is not generally known. It differs in make, but still more in application, from that employed for ordinary writing. The nib is made as broad as the thick or down stroke of the writing is intended to be, and using it no pressure is required to open the nibs, as in making a thick stroke by the common pen. The only use of the slit is to give greater elasticity to the point, and to form a channel for the ink. For very large writing, two other slits are sometimes made; one in each alabaster, the other in the upper part of the nib, for making the dots. The former piece of brass with two prongs or points, in each of which is a channel for the ink, which is supplied from a small cup in the solid part of the pen just above the division of the points. The latter is a small wheel for rubbing it with; and a small wire or piston fitted within it. The ink flows between the wire and its case, and the dot is made by placing the pen upon the spot, and pressing the wire downward upon the paper.

Geometric Pen. This is an instrument invented by Seraph, an Italian, for drawing geometric curves. These curves may by combination be made to form an almost infinite variety of patterns. It is supported, as shown in the diagram, by three legs bowed so as to allow room for the instrument to work within them. These legs shut together by the joint at the top for the convenience of package. Attached to the joint is a stem or axis X, upon the lower end of which is fixed the toothed wheel A; this stem, with its wheel, is stationary, and all the other parts of the instrument move round it. Just above the wheel A is a small tube or common C, to which is attached an arm carrying two boxes and spindles for supporting the wheels DB; the spindle E is continued downward, and terminates in a socket S, through which passes an arm carrying the pencil or tracer T. The two wheel boxes DB on the one arm, and the socket S on the other, may be fixed at any part of their respective arms by means of screws for that purpose; fixed to the tube C is a small circular plate of metal with a milled edge, by which the instrument is moved around its axis by the thumb and finger.

The sort of curves produced by this instrument depend upon three circumstances: first, the relative size of the wheels A and B; second, whether the wheel D is employed in a direction contrary or similar to each other (this wheel has no effect otherwise, and may be of any convenient size); third, on the relative distance of the tracer T from the spindle E, and of that spindle from the axis X. The relative distance of the tracer T from the spindle E may be expressed by the relative distance of T and E. The following diagram gives an idea of a few of the most simple curves. The number of parts of or leaves in the figure depends on the first of the three circumstances above-mentioned: for fig. 1 the wheels A and B must be for fig. 2, as 4 to 1; and for the rest, as 3 to 1. On the second circumstance depends whether the loops or points
are within the curve, as in figs. 1, 2, and 3; or on the outer side, as in the others; and lastly, upon the third circumference depends a shape of penalty. For loops themselves, the eight curves given above, \( E \) must be less than \( E X \), but if this is reversed, the curves assume a most curious, complicated, and sometimes beautiful arrangement.

Suardi states that 1273 curves may be produced by the changes of twelve with the smallest having eight, the next sixteen, and so on to ninety-six teeth, and that by the addition of a few pieces, spirals with a circular base, and particularly the spiral of Archimedean, may be produced.

For further information the reader is referred to Suardi's work entitled 'Nuovo Istrumento per la Descrizione di diversi Obbe Antichi e Moderne,' &c.; and to Adam's Geometric Essays.

PENANUS. [SHIRMP.

PENALTY, in its original and proper sense, is a precipitated punishment imposed by statute upon parties guilty of certain offences. This term is also used to denote a sum of money which a party to a contract has engaged to pay in case he violates his engagement. Penalties imposed by statute are strictly regulated by statute; but with respect to penalties created by contract, the rule is neither so strict nor so uniform.

In one class of cases the courts of common law have the power of awarding damages commensurate to the injury sustained, though the parties have agreed that a fixed sum shall be paid by the party upon the breach stated and proved. The courts of common law possess this power of limiting the sum to be recovered by action to the amount of injury sustained, only where the plaintiff, by bringing an action of assumpsit or of covenant instead of an action of debt, abandons his right to the penalty of the contract stated and proved.

The third class of cases, those in which the interference of a court of equity is necessary, is much narrowed by the statute 8 & 9 Will. III. c. 11, s. 8, under which, in actions in courts of record upon any bond or penal sum for the performance of covenants or agreements contained in any indenture, deed, or writing, the plaintiff is required to state the breach of covenant or agreement which he has sustained, and damages are to be assessed accordingly. If the plaintiff recover in the action, judgment is entered up for the penalty, but execution issues only for the damages assessed as the first part of the judgment. The judgment remaining as a security against future breaches of the same covenant or agreement, or of other covenants or agreements contained in the same instrument and protected by the same penalty. [Bond; Damages.]

PEN

It was formerly usual to insert in leases a stipulation that if the rent were not paid on the day on which it became due, a small sum should be added for every day during which it remained unpaid. This graduated penalty is called a nomine poena, and the landlord may distrain [DISTRESS] for it. A nomine poena is seldom found in modern leases, the interest of the landlord being considered sufficiently protected by a clause usually inserted, enjoining the landlord to make the lease void in case of non-payment of rent or breach of other covenants.

PENANCE (in Latin, Pemnentia) is a censure or punishment, enjoined by the ecclesiastical or civil authority, for the punishment or correction of the soul of an offender, in case of some crime of spiritual cognizance committed by him. Thus a person convicted of adultery or incest was adjudged to do penance in the church or market, bare-legged and bare-headed, in a white suit; and was required to make public confession of his crime, and to express his contrition in a prescribed form of words. After a judgment of penance has been pronounced, the ecclesiastical courts may, upon application by the party, take off the penance, and exchange the spiritual measures for a sum of money paid and applied to pious uses. This exchange is called a commutation for penance; and the money agreed or enjoined to be paid upon such a commutation may be sued for in the ecclesiastical court.

The peine forte et dure imposed upon a person who stands mute on trial of his guilt is a common law term for inaccurately termed penance. [PUNISHMENT DUE.]

PENANG, PULO (or Island of Penang), is the seat of government of the British possessions in the Strait of Malacca. These possessions consist of the Island of Penang, peninsular Malacca, and Singapore. The latter are not noticed under separate heads.

The Island of Penang, also called Prince of Wales' Island, lies between 5° 16' and 5° 36' N. lat., and 100° 9' E. long.; it extends from south to north about 16 miles, with an average breadth of eight miles, which gives a surface of nearly 130 square miles. This island consists of a mass of rocks, which occupy about two-thirds of the surface, and of two long narrow soil ridges, one in the eastern and western side of the rocks. The western plain is mostly a swamp, and nearly uninhabited; but the eastern, which on an average is two miles wide, and opposite George Town more than four, is at present well cultivated and populous. The high proportion of the mountains occupies the middle of the island; where Mount Elbeira, or Mount Maccabaster, rises to the elevation of 2590 feet, according to an estimate. Farther north is Flagstaff Hill, which is 2248 feet high, according to measurement. The height above sea-level varies between this highest point and the eastern end of the island, and rises to the elevation of 600 to 800 feet. The mountains are covered with lofty trees, except their summits, which are naked for about 200 or 300 feet from the highest point downwards. Extensive tracts consisting of fields and woods, and contiguous to them mud banks which frequently change their position and extent. From the belt of mangroves the country extends in gentle undulations to the foot of the hills, and has an indifferent soil, except where it is interrupted by deeper depressions containing an alluvial soil which yields good crops of rice. The narrow valleys which extend into the mountains have their slopes covered with a tolerably fertile but varying soil.

The province Wellesley lies opposite Pulo Penang on the Malay Peninsula. This province is separated from the island by a strait, which at its southern extremity is nearly 10 miles wide, but grows narrower farther northward; opposite Fort Cornwallis it is hardly two miles wide. Province Wellesley extends from 5° 10' to 5° 36' N. lat., and 10° 30' to 11° 1' and 100° 18' E. long. It extends along the coast about 30 miles, and from 6 to 10 miles inland. On the east it borders on the kingdom of Kedah, or Queda, which is dependent on Siam, and the boundary on this line was regulated in 1826 by the British^ line of demarcation, which is formed by the river Muda, which separates it from Kedah, and on the south it is separated by the river Kran from the state of Perak. The area is estimated at 150 square miles. The mountain-ranges, which in this part extend to the Peninsular Mountains (Malay Peninsula), do not approach so near the sea as to enter the province, except near the river Juru (5° 20' N. lat.), where one of their offsets terminates in the Moratam, a hill 1800 feet high, the western slope of which lies within the English
PEN 400 PEN

especially in the central and southern districts, where the
sugar plantations occupy about 900 acres of land; they
are in the hands of the Chinese settlers. These people also
cultivate three different plants, from which they make
indigo, but the product is too crude for the European market.
The leaves of a plant, called rupee by the Malays, are
occasionally exported in considerable quantities by Arab traders,
who use them as stuffing for mattresses and pillows; and
Siam they are used for making perfumery. Tobacco, coffee,
and cotton are only raised for consumption. A considerable
proportion of the population is exported to the east coast of
Kedah. The area-nut, whence the island derives its name (Area-nut Island), is not much attended to at present;
though its cultivation constituted the chief occupation of the
Malays, who first occupied the island. All the area
raised on the east coast of Sumatra is brought to Penang,
and hence exported to other parts of Asia.

Rice and Indian corn are the only kinds of grain cultivated.
Rice-land in Penang yields on an average about 75 bushels
but in Weailey Province more than 100 bushels. As Indian
corn is considered by the Malays far inferior to rice as food,
its cultivation is not extensive. The plantains and bananas
are, next to rice, the principal objects of agriculture, and
in times of scarcity supply in some measure the place of
grain. Many varieties are raised.

No country on the surface of the globe possesses a greater
variety of fruit-trees than the Malay Peninsula and the Indian
Archipelago. The fruit-trees which are cultivated are the
mangosteens, durian, jack-tree, chompadah, a species of jack-
fruit, and black waters. The jack-tree is a tall tree, not unlike
jamboo king and jamboo ayer mawah, num num (cynometra
cauliflora), lime, custard-apple, mulberry, pine-apple, the
grape, and sugar orange. Many other fruit-trees are found in
a wild state in the forests on the declivities of Mount Morat-
ajam, and the slopes of Mount Weal; and Captain
Low mentions twenty-three different kinds of fruit brought
from the skirts of Mount Moratajam to Penang.

The same author gives a list of 126 different kinds
of trees and plants on the mainland of the country, and applicable
to building and other domestic purposes. The bark of
other trees is used for tanning leather and for felts. The
India-rubber tree grows along the western boundary
of Province Wellesley. Dammer, or the resin of the
dammer-tree, is collected and used for paying vessels. Minah
dammer, or wood-oil, is the sap of another tree, and em-
ployed for coating the sides of tea and coffee vessels.
The Malaya tiger is a favourite occupation with the Malays, and they build
goats. Oil is extracted from the fruits of several trees,
both for burning and for culinary purposes. The bark
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Besides the native vegetables, which are numerous, the
Chinese cultivate cabbages, celery, and lettuce. Peas
and carrots thrive well, but potatoes have not succeeded. There
are however many varieties of sweet potato, one of which
is much esteemed. Yams, both red and white, and French
beans, are extensively grown.

Buffaloes and cattle are rather numerous. The cattle
are reared for the dairy, the cattle for slaughter being chiefly
imported from Kedah and Patani. The black buffalo is
most prized, both for draft and slaughter. The annual con-
sumption of cattle on Penang and by the shipping is about
300 head. About 400 buffaloes are slaughtered yearly.
Goats and sheep do not abound, but a great number of
buck-goats are reared for food. The goat is extensively
raised in Province Wellesley, whence upwards of 120,000 are
annually sent to Penang. A great number of ducks are reared,
and their salted eggs form an article of provision for native
prah, Chinese, and English sailors.

Wild animals of the larger size are found in Wellesley
Province, as the elephant, rhinoceros, and tiger. The
elephants are sometimes exported to Madras, and used in the
neighbouring states to carry the tin from the mines to the
coast. The tiger is also a wild beast of the island, and
also the plundak, a hornless deer about the size of a hare,
with great numbers. There are also several kinds of
dogs.
Birds are found in great variety, and many of them have great beauty. The catching and preserving of the skins with the feathers on, of the larger kinds of kingfishers, is a lucrative employment of the natives. These skins are exported to China, where they are used for embroidery dresses. The other birds most distinguished by the beauty of their feathers are, the paru, which has a brownish crimson plumage, and is rather larger than a moor-fowl; the large kwaung, or Argus pheasant, and the smaller sort, which has its back splashed with eyes; and the marragh, or the peacock, which has a magnificent plumage of a light golden hue.

Penang is cheaply and plentifully supplied with fish. Besides the porpoise and skate, Loor has enumerated fourteen species of fish which are considered as poisonous or wholesome, and fifty others which are eaten. A small species of whale frequents the strait between Penang and the province at intervals. Fishing-stakes afford nearly exclusive employment to numbers of Chinese and Malays. There are eighteen species of crabs, oysters, and other shell-fish. A species of sea-turtle, the hog-billed, is frequent in some places, and another smaller kind in the rivers: the eggs of both species are eagerly sought after.

Gold, which is found in nearly all the states of the Malay Peninsula, does not occur within Wellesley Province. Tin was some years ago discovered to exist in some places, but in too small a quantity to be worked.

When the English took possession of Penang Island (1786), they found only a few Malay families, mostly fishermen; but natives from the neighbouring countries, as well as Chinese, and Chulias from Hindustan, soon flocked to it, and the population, in 1835, consisted of ten different nations.

**Population of the Island of Penang.**

**Fixed:**
- Europeans and their descendants: 700
- Armenians: 21
- Malays: 16,435
- Achinese (Sumatra): 350
- Batuts (Sumatra): 561
- Chinese: 8,151
- Chulias: 7,886
- Bengalese: 1,322
- Siamese and Burmans: 648
- Arabs: 142
- Parsees: 60
- Native Christians: 708
- Caffres: 180

Total: 37,844

**Fluctuating:**
- Native military and followers, averaged at: 700
- Convicts (from Hindustan): 1,263
- Itinerants: 400

Total: 2,363

Thus the population of this province has doubled ninefold in fifteen years. It contains 293 persons on a square mile, and the island 310 persons.

George Town is built on the eastern side of the Island of Penang, where it projects into the strait, and contains a population of 20,000, mostly Chinese. It is the seat of the governor of the British possession, the Strait of Malacca, and carries on a considerable commerce. The harbour, which lies on the south-east of the town, is well sheltered, and may be entered by any kind of vessels from the north; but vessels drawing more than 16 feet of water cannot sail through it. The western part of the town is inhabited by the majority of the vessels sailing from Hindustan to China, and likewise by vessels from China, Arabia, and Siam. There are sometimes 300 vessels in the harbour. Since the foundation of Singapore, it has ceased to receive the commercial productions of the countries on the Archipelago, and the countries of the Malay Peninsula; but it is still the principal place to which the inhabitants of the eastern coast of Sumatra and the countries north of Malacca bring their goods. These goods consist of pepper, benzoin, camphor, gold-dust, areca-nuts, rice, yams, sago, bromelium, linseed, sugar, oil, tobacco, birds'-nests, trepang, and ivory. In 1823 the value of the exports of this place was estimated to amount to nearly 1,000,000l., and probably it is not less at present. It exports the coast of Sumatra and the Malay countries north of Malacca, various kinds of picee-goods from England, Bengal, and Coromandel; cotton, opium, iron, steel; European coarse blue, red, and green cloth, and coarse cutlery. James Town is a small but busy trading place, a few miles from the eastern shore of the plain of Penang Island, in a very fertile district. There are no towns in Wellesley Province; but in the northern more fertile and better cultivated districts, in some places, the higher parts of the low ridges are covered by continual rows of houses for several miles. The most extensive of these villages is Pinang.

**History.**—Before 1786 the island and province belonged to the small kingdom of Kedah. In the war between the English and French, which terminated in 1763, the want of a good harbour in the southern part of the Gulf of Bengul was much felt by the British, and in 1786 they became desirous to acquire one on the eastern shores, as the coast of Coromandel does not offer such a place. The Island of Penang was found fit for the purpose, and it was purchased for the property of an Englishman, Capt. Francis Light, of a country ship, who had received it from the king of Kedah as a marriage portion with his daughter. Capt. Light transferred his property to the East India Company, and was appointed first governor of the island. It was at the same time agreed to pay 6000 Spanish dollars annually to the king of Kedah in consideration of his ceding the sovereignty of the island. The British flag was hoisted on the 7th July, 1786. When the harbour began to be frequented by numerous vessels, great inconvenience was frequently caused by the same inhabited, especially by the native merchants, from the piratical vessels which infested the strait and took refuge in the rivers which enter the sea opposite the island. The Company was accordingly desirous to get possession of this coast also, as it then was nearly uninhabited, the object was attained by increasing the annual payment to the king of Kedah to 10,000 Spanish dollars. This country, which then contained only 1500 inhabitants, including a very few Chinese, was then termed Point Wellesley, which, not being a very correct designation for a line of coast, was subsequently changed to Province Wellesley.

(Crawford's *Journal of an Embassy to the Court of Siam and Cochin China*; Finlayson's *Account of the Mission to Siam and Hue*; Small's *History of Polo Penang*, in ' Asiatic Researches,' vol. xviii.; and Capt. Law's *Dissertation on the Soil and Agriculture of Polo Penang and Province Wellesley*, Singapore, 1835.)

**PENATES** were Roman deities who were supposed to preside over families and houses. *Cicer* (De Nat. Deor., ii. 27) derives the word either from *penus*, 'food,' or *penitus*, 'inmost;' but it appears probable that the latter etymology is the more correct. We learn from Festus (*Penus*) that the inner part of the temple of *Pennis* was called *penetraea,* which seems to be connected with *penetes, penetrare,* and *penetratia.* The heath of the arium was sacred to the Penates; and as this place was the innermost or most important part of that house, it was called the *Penetraria.*

There appears sometimes to have been a kind of recess in the wall, called *sacarium,* in which the images of the Penates were kept. (*Cic. in Verr., iv. 2; Digid., i. tit. 8, Vol. XVII. 3 F*.)
Every master of a family was the priest to the Penates of his own house. It is a matter of extreme difficulty to determine who the Penates were; but there is no reason for believing that they were the same in every family. Some writers have thought the Larres and Penates to be the same, and it would appear that the Larres were included among the Penates. The Larres however were of human origin, and appear to have been regarded by the Romans as the manes of their ancestors [Larres]; while among the Penates we find mention of the superior gods, as Vesta and Jupiter. (Festus, s.v. Hercu-

There were also public Penates, who were supposed to have been brought by Aeneas from Troy. They were represented as two young men with spears in their hands, and the temple or chapel in which they were worshipped was not far from the temple of Vesta. (Dionys. i. 68; Cic., De Nat. Doctr., ii. 27; Liv., xlv. 16.)

The modern Genoese retain the custom of keeping household gods like the ancient Romans. There is no house without its Lararium, and the Penates are conspicuous in every shop, indeed perhaps more so than in any other part of Italy. (Communication from Genoa, 1839.)

(Hartung, Die Religion der Römer, p. 71-81.)

PENCIL, the name given to the small brushes used by artists, whether made of hog's bristles, camel hair, flock, or sable. The larger brushes are sometimes set in a tin tube, and the smaller in quills of different sizes. The hairs of a well-made brush should, when wetted, terminate in a fine point.

The well-known black-lead pencil is made by cutting a Cumberland lead, or plumbago, into thin plates with a saw, and again into strips as wide as the plate is thick. These strips are then laid in a groove in a piece of cedar, upon which is glued another and thinner piece: the whole is afterwards rounded by a plane adapted to that purpose. Pencils are commonly marked with certain letters to denote the quality of the lead, as H for hard, B for black, M for medium, and so on.

Other pencils are made of black and coloured chalks for drawing, and are much more convenient than the port-

The ever-pointed pencil is an instrument so simple and so well known as to require little description. The point, or nozzle, is made hollow to receive a small cylindrical piece of black-lead, about three-quarters of an inch long, which cannot pass through the lower end without some force. Within the case is a screw or worm, which case be turned round by one hand while the point of the pencil is held by the other, causes a wire about the same size as the lead, to revolve. When a fresh lead is put into the point, it is turned round towards the left until it can be screwed on to the case: gently to the right hand, the until it can be made of different kinds, marked according to the size and quality of the lead required. Ruby holes, each... they are rendered... no impellent to the wood, and made with a reservoir at the lead end may be carried.

PENCIL, a term of optics, and... A pencil of rays is a collection of rays... or diverge from the same point; and a pencil... number of lines which meet in one point.

PENDENNIUS CASTLE. [FALMOUTH.] PENDENT, or PENDANT, in Gothic architecture, a ornamental mass of stone, hanging down or descending from the intersection of a groined vaulting. Pendants, no doubt originated in bosses, of which they may be considered an enlargement, and may be described as being of a corbel or bracket shape. They are almost peculiar to the later florid English or Tuber style, in roofs of fan-work tracery, of which they are the right beautiful features, admitting of great variety of design. The roofs of King's College Chapel, Cambridge, St. George's, Windsor, and Henry VII's Chapel are fine examples of the effect of pendants. Carved pen-

dents of a different kind were frequently enrichment of timber-roofs, but are not being suspended, not from the centres or extremities of the hammer-beams, from wood-work forming the arches of the roof. This kind is the roof of the hall of Eatham Pe-

PENDENTIVE, though often synonymous with pendant, has quite a different sense, which however hardly any explanation of any English architectural works, nor is it to describe the thing itself intelligibly. Strictly speaking, pendent, or triangular spaces between the arch walls, as the case may be, may be, supporting the timbers of the wall to the springing of such a dome, or the same diameter (as in the Pantheon). Pendentives, although there may be cylindrical or polygonal circumferences. In such cases the spandrels, or spandry, are very improperly called pendent, as they sometimes are so, portions of the inner surface of the intersected by vertical planes, which solids. The dome of the half-cylinder and Westminster bank of the equality of the oscillation of the string or wire was first discovered by Huyghens about 1658, in the escapement, where the pendulum and pendulum itself, while the duration of each astronomical clock has hitherto continued to define the instruments in the clock and watch, is supposed to be adopted by the makers of clocks and watches. The first PENDANT, so far as known, is a device used in the making of clocks and watches.
make the leaden cylinder an inch longer for a first trial; but even if the pendulum should turn out to be under compensated, an additional ring of lead may be added, above or below, of the thickness required. A lenticular form may be given to the weight, provided the proper length be preserved, and this will be an improvement, as it diminishes the resistance of the air, and the error which arises from the inertia of the air carried by the pendulum.

To the best clocks, either the gridiron pendulum of Harris is recommended (which is largely used in England and is still in repute abroad), or the mercurial pendulum of Graham, which is now employed by most makers in this country.

The above figure is not exactly the pendulum as composed by Harrison, but according to his principle. The steel rods 1 and 5 are pinned into two brass cross-pieces, Aa, Bb. The zinc rods 2 and 4 are pinned into Bb, and carry a cross-piece above, into which the steel rod 3 is pinned. Rod 3 passes freely through a round hole in Bb (this is shown by dotted lines), and is tapped into a screw below; the bob rests upon the nut, which works on the screw. The steel rods 1 and 5 expand downwards, the rods 2 and 4 expand upwards, and the steel rod 3 downwards; and it is possible so to adjust their lengths (the expansion of zinc being more than double that of steel) that the effects of the expansion downwards and upwards shall have no effect on the length of the pendulum or time of oscillation.

Harrison used brass instead of zinc for the upward expansion; and in order to produce a perfect compensation, was forced to use four more rods, a second pair of brass to expand upwards, and another pair of steel to expand downwards; nine in all. The foreign artists use zinc, which requires only five bars, less workmanship, and only one nice fitting. Zinc is objectionable as being a weak metal, and it is said by some persons to expand by jumps, which seems not very probable unless much exposed. The great objection to the gridiron pendulum is that the astronomer, if he be no workman, must rely upon the artist for perfect compensation (and this is perhaps never achieved); and again, if from rust or bad fitting the slipping parts should bind, the action will necessarily be by bounds and irregular. After the clock-maker has done his best, a year's experience will point out the error in the compensation, which can be easily remedied, if the fault be over-compensation, by cutting the zinc rods shorter. All the fixed parts should then be secured as firmly as possible by steady pins, as any attempt to reserve a power of further adjustment would be too dearly purchased by a ricketty frame. One or two flat brass horizontal bands are attached to 1 and 5 to keep the zinc rods in their places. These bands should not squeeze the zinc, and but just press against them with the spring of the metal. (Harrison is said, by Short [Phil. Trans., vol. 47, p. 517], to have invented his pendulum about 1725.)

In Graham's pendulum, a glass jar, partly filled with mercury, is supported in a sort of steel stirrup. The pendulum rod passes through the top of the stirrup, and is held by a nut and adjusting screw at D. The height of the mercury in the jar is about 6 1/2 inches; but this varies somewhat with the diameter of the jar, the substance of the rod and frame, and perhaps the variable expansion of the steel rod. The compensation can be altered, and finally footed, by the astronomer. This quality, and the absence of any nice fitting or slipping parts, give Graham's construction a very decided superiority over Harrison's, especially for a clock which is not to be moved from place to place. These mercurial pendulums are generally constructed in a more expensive manner than is necessary. The vertical apements are almost rods may all be made of stout steel wire, and the base and top of the stirrup of brass. Mr. Baily, in his valuable memoir above referred to, very justly remarks that the vertical apements are almost, in the same number of which an ingenious, and others very simple. Those above described will suffice for an explanation of the principle; they are the most usual, the most easy of execution, and most exact in their operation.

If an escapement could be contrived which gave its impulse to the pendulum at the middle point of its vibration, and was wholly detached from it at all other times, such an escapement would be perfect; and the vertical apements are almost to be considered good or bad as they approach this character. But in those which at present exist, time and dirt and thickening of the oil not only affect the amount of the impulse, which is the result of only a moment, but the continuing action of the teeth on the pallets is also irregular. The space through which the pendulum swings, or are of vibration, is thus liable to variation, which again produces a change in the time in which each oscillation is performed, that is, if the pendulum be supposed to oscillate round a fixed axis. This inequality was more apparent in the early clocks, where the pendulum was light and the arc of vibration very large, than in those of modern construction, where the pendulum is heavy and the arc small. Huygen's proposed to correct this by a remedy, viz., that the upper part of the pendulum, which he made of two parallel strings, should wrap and unwrap on two cheeks, which, being shaped as cylindrical, caused the bob itself to describe a cycloid. Now it is a property of this curve that all arcs are described in exactly the same time as that Huygens' construction was a perfect remedy of the error mentioned. It is said by all later writers on the subject that the remedy is worse than the disease, and it is possible enough that something like sticking between the flexible top and the cycloidal check may take place at the critical points, i.e., just when the pendulum has arrived at the end of its swing, and is pausing for its return; and that there may be a difficulty in making and setting the cheeks so truly as to act on the pendulum in every part of its swing. A second objection alleged against Huygen's cheeks—that, as the pendulum cannot be considered to be a heavy point
suspended by a rod without weight, the centre of oscillation shifts downward as the flexible portion of the top wraps on the cheek—might be easily got over by making the cheeks not truly cycloidal, but of such a form that the centre of oscillation of the compound pendulum shall oscillate in a cycloid, which would be easy enough when the form of the pendulum was given. In truth this is a matter of more speculation in astronomical clocks, for there is a much easier way of making the pendulum periodical in their whole, which will describe; but we suspect that the cycloidal cheeks might still be used advantageously in clocks which resemble Huyghens's, as the Dutch clocks which are in common use.

Instead of suspending the pendulum by a perfectly flexible string, or on a knife-edge, when the motion must be in a circle, the top of the rod ends in a flat spring. (See the foregoing figures, where the spring is seen in front, like a fine line, at the top of each pendulum.) This pendulum has a few effects upon the time of oscillation: first, by retarding the motion of the pendulum in its rise and accelerating its fall, the spring shortens the time of vibration, and the more the stronger it is; but as its action at each point is nearly proportional to the power which caused the clock to gain or loss in the larger arches, which, on the information of other makers, and on theoretical grounds, we consider possible.

With a spring stiffer than that which was isochronous, Mr. Frosham found that using as effective lengths 0'9, 0'6, 0'4, 0'2, and 0'1 inches, the period would be increased by using 4lb. 10oz. as the weight, instead of 2lb. 2oz., to give the clock a losing rate of 3'7, 2'6, and 3'5 respectively. The law is not apparent, and it would seem that the cause of the shortening the spring had no sensible effect. Another remark of Mr. Frosham's, which is very valuable if it is confirmed by extended trials, is, that the spring which produces isochronism is also the spring with which the pendulum, unattached to any clock, will keep up its motion for the longest time. It seems to us probable that this latter quality will belong to the weakest spring which preserves its full elasticity under the pull of the bob; for if the elasticity were perfect, the only cause of loss of motion would be the resistance which is not affected by the effect of the spring. However this may be, the subject is well worth further consideration. Notwithstanding the care bestowed by Mr. Frosham, it is difficult to conduct inquiries of such nicety with an uncompensated pendulum. It will also be necessary, when we shall come to speak of the state of the barometer when the experiments are in progress. For when the effect of the air upon the time of oscillation of a pendulum is examined, it will be found that the air has an indirect one of shortening the arc of vibration, that is, of tending to make the clock gain, if the bob move in a circular arc. The buoyancy of the air acts more immediately, for it diminishes the weight of the pendulum, and leaves the inertia therefore diminished. Hence a greater density in the air as a diminution in the force of gravity, i.e., makes the clock go slower. The effect is greater indeed than was at one time anticipated; for, as was remarked by Du Bois fifty years ago, and as has been recently shown by Bessei, the pendulum must be considered to include in its inertia a small weight of air, which is involved in it or accompanies it. (See a very elaborate and valuable memoir by Mr. Baskin, 'On the Correction of a Pendulum for the Reduction to a Vacuum,' Phil. Trans., 1832, p. 399.) This latter portion of the effect of the air depends on the form of the pendulum, and on the place of the pendulum and the bob in it. The former is certainly not perceptible to the eye, but the former requires either a specific and certain compensation, or may be determined as a residual quantity, and tabulated for each clock with the mean height of the pendulum, and other such compensations, as we now use. While we have no investigation of the effect of atmospheric pressure on the time of the transit clock at the Armagh observatory, in the Mem. Roy. Soc., vol. v, p. 125. The author, Dr. Robinson, assumes that the variations of a clock from a constant rate are expressed by the sum of any one depending on the temperature, the other on the pressure of the atmosphere shown by the barometer. The isochronism of the spring is supposed, or that the effect of any change in the arc depending on the above two causes is already expressed in the pendulum. When the temperature is determined, this can readily be rectified by altering the quantity of mercury in the jar. The Compensation for the variation of atmospheric pressure was made by changing small barometers to the pendulum rod, but we believe that the compensations in this country for the general variations as much as the increased buoyancy and inertia would retard it, or so nearly so, that the remaining difference might be completely annihilated by a proper selection of the pendulum spring. We have no complete tests of the effect of the change of the moving power, or of the action of the escape, on the arc, and shall not alter the equilibrium. As the effect of the time is generally to produce a falling off in the arc, a small addition to the sum of the weight might be made from time to time, so as to bring back the pendulum to its primitive arc, until the clock is cleaned, and its action restored that way. We shall conclude this long discourse (which we propose for consideration until decisive experiments can be witnessed) with the observation that the compensations in the parts of the clock, and of its pendulum, if much exposed may take their temperature at different times, and if so, the compensating principle is not brought into action, but must act irregularly.

It has already been said that a clock, to go steadily, should be securely fixed. The common mode is to fasten the case by strong bolts, under the rising board and again above as low as the pendulum bob, to a stone pillar or through the wall. It has been altered by setting a clock on the back of the frame, but it is still set on a triangle standing on the rising board, or even from the back of the case, but there is then a fear that the axis of motion may not be in the axis of the pallets, or may not have in the motion of the clock. The clock makes with the pallets the same small acceleration and retardation as in the same axis. When the clock is fastened at the proper part of the case, it makes the pallets move in opposite arcs of the circle, and the operation is performed as follows. The beats nearly correct by ear, and by touching the key note which screw belongs to the longer leg. Then by
softly deadening the pendulum as it rises, make it just not escape on one side. By very gentle pushes cause it to escape on that side, and see whether it escapes on the other; if it does not, remove the spring by loss of heat and the pendulum released. After a few trials and errors it will be found that when the pendulum just escapes on either side, it will just escape on the other, and if there be a very small inequality indeed, a little tightening of one of the crust screws will correct it. But it is not always possible to bring it to rest, and the zero of the plate on which the arc of vibration is read off, be fixed just behind the pointer of the pendulum, shown at C.

To bring a clock to time, first make it nearly right by the adjustment of the hairspring, it has a losing rate, which must be determined by observation after the interval of one or more days. Suppose it is losing 3° a day. Put a weight, which has been carefully ascertained, say 200 grains, upon the plate which covers the jar (E in the mercurial pendulum, in the gridiron pendulum anywhere near B), and find the fresh rate of the clock by observation. Let it now gain 10° a day. Then, as 200 grains cause a gain of 13° a day, 15/4 grains will alter it 1° per day, and replacing the 200 grains the amount of 462/4 grains will bring the clock to time.

In an observatory it is always desirable that a clock should have a small losing rate, and be slow rather than fast (the corrections for clock error and clock rate are then additive), so that it would be better to add a smaller weight than that of the pendulum, and not more to destroy the rate by two operations, especially if the preceding rates were not very carefully determined.

The final adjustment of the compensation can be best accomplished when the clock has gone several months, and consider the clock which presents the greatest deviation. The displacement of the pendulum by gravity is compared with the temperature of the air, and the rate of the clock is about 1 in 200 grains; hence 1 lb. of mercury, and bring it to a close rate exactly as before; and now let it be over-compensated, so that an increase of 2° in the temperature causes it to gain 0° per day, or to lose 0°.5 by 3° of temperature. Hence it is clear that as 1 lb. of mercury causes an alteration of 1°5 in the variation due to temperature, if a third of a pound be withdrawn the compensation will be nearly correct. A second trial will perfect the compensation, which should never be afterwards disturbed.

Length of Simple and Invariable Pendulum.—The equality of the oscillations of a weight suspended by a line is said to have been used by Ibn Junis, A.D. 1106, and by the Ancients of the east to the same effect as is used by Mouton (Young, Nat. Phil., vol. i., p. 595). This property of the pendulum was remarked by Galileo when a student at Pisa, by observing the vibrations of a lamp swinging from the roof of the cathedral, and was by him proposed as a measure of the observations on the pulse. (Annals of water, Life of Galileo, p. 5.) The simple pendulum was much used as an astronomical instrument (called perpendiculum in the older writers) before it was adapted by Huuygens to the clock. Mouton (Observations Diametric Solis et Lunae, Lugd., 1670) applied the vibrations of the simple pendulum successfully to measure the time in which the sun and moon describe their respective diameters, and in the Appendix, p. 427, proposes his nova mensuratione apud solis et lunae aequato inter se perpendiculum, based on the value of a minute in Riccioni's length of a degree. This is his miliare, the thousandth part of which he calls a virga; and then finds by experiment that the virga, which, according to Riccioni, is 3 ft. 4.363 in. Bolognese measure, is very near the true length of the pendulum which makes 1229 oscillations in half an hour.

In 1671 Picart was sent to determine the position of Tycho Brahe's observatory at Uraniborg. He took this opportunity of swinging the pendulum, and found the length of the seconds pendulum 3 ft. 9 in. 8¼ L. Paris measures, exactly the same as he had previously found it to be at Paris, and subsequently at Cetta, on the south coast of France. Roemer obtained the same result at London, and these erroneous measures of Picart, the first astronomical observation of his day, were for a long time cited as objections to the theory of gravitation.

In 1672 Richer was sent to Cayenne (about 4° 56' N.) to make a course of observations, and among the rest to observe the length of the seconds pendulum. His words are: 'L'une des plus considérables observations que j'y faites, est celle que la longueur du pendule en secondes de temps, laquelle s'est trouvée plus grande en Caïenne qu'à Paris: car la même mesure qui avait esté marqué en ce lieu-là sur une yerge de fer, suivant la longueur qui s'estoit trouvée nécessaire pour faire un pendule à secondes de temps, de 770 grains, en est devenu grande aux 800 sans avoir pris cupe de soin. Les vibrations du pendule simple dont on se servoit, estoient fort petites et durisoit fort sensibles jusques à cinquante-deux minutes de temps, et ont esté composées à celles d'une horloge tres-excellente, dont les vibrations marquoient les secondes de temps.' (Recueil des Observations faites en plusieurs Voyages par ordre de sa Majesté, p. 66, Paris, 1693.) We have cited this passage textually, not only on account of its importance, but because it is generally merely as a check on Richer's clock, which was carefully regulated on Paris time, lost more pendulum of a smaller order at Cayenne. This misrepresents the evidence of the experiment, and moreover leaves room to suppose that Richer made a chance discovery, whereas the determination of the length of the pendulum was the special object of his mission (see p. 2). Neither Picart nor Richer gives any details of his modus operandi.

In 1673 Huuygens published his 'Horologium Oscillatorium,' perhaps the most remarkable mathematico-mechanical book which preceded the 'Principia.' Principal among its results is the expression for the isochronism of oscillations in a cycloid, and the mechanical means of making the pendulum swing in a cycloid. He gives theorems for finding the centre of oscillation of pendulum and of natural figures, and thence the length of the simple pendulum, corresponding to a cycloid, and the specific forms; and in propositions 19 and 20 (p. 124-5) proves that when the body is the same, the distance of the axes of suspension from the centre of gravity are reciprocally as the distances of the centres of oscillation from the respective centres of oscillation, and that the point of suspension has an influence on the time of oscillation are convertible. His proposition 25 (p. 151) is on the mode of fixing a universal and perpetual measure, which he proposes should be the third part of a seconds pendulum, and names a pendule troisième.

Newton, in his 'Principia,' lib. ii., sect. 10, investigates the oscillations of a body in a cycloid, or in any other curve; lib. ii., sect. 6, he considers the effects of a resisting medium on a pendulous body; and lib. iii., prop. 19, he determines the length of a simple pendulum, and the relation of the length to density, to be a sphere of which the equatorial and polar diameters are as 229 : 229. In prop. 20 he computes the lengths of the seconds pendulum and of the degrees of the equator; and which are required on the foregoing suppositions; and he remarks, 'Quod inequalitas diametorum terrae faciunt et certius per experimenta pendulorum compreheni possit quam per arcus geographiche mensuratos in meridianum.' In the following pages is an analysis of the lengths of the pendulum which had come to his knowledge.

We have not been able to find any account by Graham himself of two very capital improvements which he seems to have introduced into pendulum experiments. The first is a clock, in which 'he carefully contrived that its pendulum might at pleasure be stopped by the pull of a string or thread; there should be occasion to remove the clock from one place and set it up in another.' (Bradley's Account of the going of a Clock by Graham, in London, and at Black River, Jamaica, Phil. Trans., vol. xxxvi., p. 302.) Probably this was done by driving a clip through a clip to a given mark; for in another description of a similar clock it is said the suspending spring was broken. We do not however see any need for any adjustment in this respect, if the spring be pinned into the slot and end into its upper axis. The pendulum was notcompensated, but one thermometer was enclosed in the clock, and as the rate in different temperatures at the same place had been determined, the reduction to a normal temperature was easy. Clocks of this kind were supplied to the French Navy for the expeditions of that nation to Brazil and Peru. For this latter expedition Graham supplied Godin with a detached pendulum, which Godin thus describes:—

* This volume contains Picart's observations, as well as Richer's.
Ce pendule est composé en general d'un étendue de cuire, d'une boule de même matière à un de ses bouts, et d'une piece d'acier taillé en couteau à l'autre bout, qui est celui de suspension suivant le portée du pendule dans les deux points qui designent l'axe du mouvement du pendule. (Adac. Roy. des Sciences, 1735, p. 507.) He says its motion was sensible for eighteen hours. It seems that this pendulum, the vibrations of which were to be counted, was a closed one, and was furnished with a vertical tube for measuring the actual length of the pendulum. Messez, Bouguer and La Condamine both had detached pendulums made after Graham's idea. Bouguer (same volume, p. 526) describes this pendulum as an invention of his own; La Condamine (Journal du Voyage, p. 133) is open, and says he took the idea from a copy which Hugo made after Graham's. This is almost exactly Katz's invariable pendulum. Mairan's measurement of the length of the seconds pendulum (Acad. Roy. des Sciences, 1732, p. 123) is a good specimen of the old method of measuring the length of the pendulum: and the measures of Godin, Bouguer, and La Condamine, in the same volume, are worthy of notice. For references to various pendulum experiments, see Lalande, Astronomie, 3rd edit., s. 2710, etc.

In the first volume of the Transactions of the Society of Arts, p. 238, Mr. Hatton proposed, as a mode of fixing a permanent standard of length, to suspend a weight from a fine hair to a chip in an upright frame, sliding up and down in a vertical plane, and as the hair passed between two fixed points the time of one oscillation would be measured. The weight was to be swung, and the vibrations counted, in two positions of the bar, and from the difference in the times of vibration the length of the bar was moved, the length of the seconds pendulum was to be compared.

In 1787 Mr. John Whitehurst published 'An attempt towards obtaining invariable Measures of Length,' &c, which is remarkable for its ingenuity. He suspended a leaden ball with a flat steel wire in front of a straight upright frame, the piece being long enough to make for forty-two oscillations in a minute. A clock with dead-beat escapement and a chip to hold the wire was slid up and down the frame, and secured and adjustable at two points where the chip made the free oscillations respectively forty-two and eighty-four oscillations per minute. The piece of the clock, being continued upwards in a screw, carried a weight, by moving which the oscillations of the crutch alone could be regulated to forty-two and eighty-four oscillations, and therefore would not interfere with the free oscillation of the ball and wire, but only keep up their motion. The going weight of the clock was in each case such as sustained an oscillation of 3°. It is clear that if all were properly executed, the clock-frame with its chip must have been shifted between the two positions equal to the difference between the simple pendulums which correspond to forty-two and eighty-four oscillations per minute. A line was drawn in each position along the upper edge of the clock-frame upon a brass rule fixed to the upright support, and this space was afterwards accurately measured, and the length of the simple seconds pendulum thence computed. Whitehurst's length of the seconds pendulum is 39 1/16 inches of Troughton's standard, but the corrections for the buoyancy of the air and for temperature are not introduced. It is probable that he introduced greater errors than he wished to get rid of in Hatton's method, for the real difficulty is not that of counting the vibrations, but of measuring the length between the two chips, in avoiding the errors of temperature, humidity, and other uncertain effects of suspension. The principle of Hatton's method, that of measuring the difference between two pendulums, has been adopted, as we shall see, by Bessel.

The foregoing account is merely a sketch of the history of these experiments, which, in the hands of Borda, and more recently of Kater and Bessel, has received a more accurate solution. There are still anomalies and imperfections in some parts of the processes which require clearing up, but the errors have been reduced within comparatively very small limits. Before describing these experiments we shall give a brief account of the formula which they require.

The expression which connects the time of one oscillation of a simple pendulum in an invariable arc, with its length l, at a place where the force of gravity is represented by g, is \( t = \frac{3}{8} \pi \sqrt{\frac{l}{g}} \), or circum-

ference to diameter \( l \); the measure of gravity, \( g \), being twice the space through which a body would fall freely in \( t \) s, or what is the same thing, the space through which a body would fall in \( t \) s, with the velocity which it acquires in falling freely for \( \frac{1}{2} t \).

Hence, if \( l \) be the length of the simple seconds pendulum, \( g = \frac{4}{3} t \); therefore \( g \) is known when \( t \) can be measured. Hence the length of the pendulum at a different station is ascertained, and also in the continuation to Unit in the Shetland Isles, which is included in the English Trigonometrical Survey. It is however an operation of great delicacy, and when only the corroboration of gravity between different places is required, is of less importance. But when we consider the extent of the earth, the observation may be more easily performed by supporting the same pendulum in different places, and ascertaining the number of vibrations which it makes in a day. Thus if \( n \) and \( n' \) be the number of vibrations made in a day by the same pendulum at two different places at which the forces of gravity are \( g \) and \( g' \), and the duration of one vibration at each place be \( t \) and \( t' \), then the number of vibrations \( = \frac{n}{t} = \frac{n'}{t'} \), or \( g' = \frac{g}{t} \cdot \frac{t'}{n'} \).

That is, the force of gravity varies as the square of the number of vibrations of a given pendulum in the same time, which is usually taken to be a mean solar day. If therefore the number of vibrations of a pendulum in one day at a given place, London, for instance, be known, and it is then transported to different places, and the number of vibrations in a day counted, a simple proportion will enable us to ascertain the forces of gravity at London and every place at which the observation has been made.

If the length \( l' \) of the simple pendulum at any station be required from these observations, since \( l' = \frac{t}{t'} = \frac{g}{g'} = \frac{n'}{n} \),

\( l' = \frac{n}{n'} \), which gives the length of the pendulum at any place in terms of the length at London, and the number of vibrations per diem at that place and London.

Though it scarcely belongs to our subject, we will give the expression by which the ellipticity of the earth is determined from the knowledge of the length of the seconds pendulum at any latitude, \( \lambda \). Let the length of the pendulum be \( l = A + B \sin^3 \lambda \), where \( A \) and \( B \) are constant quantities. Now from all the good observations, either of the actual length or the number of vibrations per day of the same pendulum, we can obtain the values of \( A \) and \( B \); then by Clairaut's theorem,

the ellipticity of the earth = \( \frac{A}{B} \); where the ellipticity is found. By ellipticity is meant the excess of the equatorial over the polar radius of the earth divided by the polar radius.

The apparatus of Borda will be generally intelligible from the following description and perspective plate.

The plumb-line is suspended from a knife-edge piece AB, and is attached below to a cup B, which is grounded to the top end of the platinum ball below. A little groove is rubbed on the inside of the cup, making the contact perfect enough to exclude the air and to suspend the ball. The knife-edge rests on a platina planes, a, b, which are carefully polished, and the back of the base, C, is fixed immovably in a horizontal position. The plumb-line is in front of the comparing clock, which has a small cross drawn on the bob. When both are at rest, a telescopic having a vertical line in the focus is placed a few feet distant, so that the cross, the plumb-line and the horizontal line of the telescope are all in the same right line and all seen de-
The clock is now set going, and when it is quite steady, the platinia ball is drawn a little on one side, and made to swing as near as one or both edges of the tongue may. The observer then places himself at the telescope, and notes the exact beat of the clock when the plumb-line bisects the cross and coincides with the fixed wire at the same time; this is called a coincidence. As this observation seems much less definite than in Kater's method, it is better to note those beats before and after the coincidence, when the eye cannot distinguish whether it is a coincidence or not, and to take the mean of the two for the true time of coincidence. Immediately after, the extent of the arc through which the plumb-line swings is to be read off on a scale placed just behind it; the thermometers which are near the pendulum must also be read off, and the height of the thermometer. The observer now waits until this appearance presents itself a second time (which may be in about ten minutes, though the interval is quite ad libitum), and having thus established the time which elapses between the observations, he may leave the apparatus for three, four, or five hours, when on his return the same observations must be repeated of coincidence, arc, temperature, and barometer, and the result calculated. We should recommend closing as well as commencing a series with two coincidences in majorem cautelam, but except as a check, no observations are required except the first and the last. The plumb-line is again set in motion exactly as before, and the second, third, and following series observed. The rate of the clock is established by astronomical observation.

After a satisfactory number of series has been taken, the next object is to measure the length of the pendulum. The plane 1 H is raised by a fine screw, and it just touches the bottom of the platinia ball. This is an operation of great nicety, and must be effected by two or three trials, as the exact temperature of the wire at the exact moment of contact is required; and the presence of the observer, even for a short time, is sufficient to affect a slight motion very sensibly. Suppose this done, the apparatus is removed or pushed on one side, and a bar, which has a knife-edge above and a sliding tongue below, is suspended in its place. The tongue is slid down until it touches the plane 1 H, and the distance between the knife-edge and the bottom of the tongue measures the distance between the top and bottom of the pendulum. This distance may be measured in several ways;
For a full description of Borda's method, with instances, see Bas de l'Académie des Sciences, vol. iii., p. 237 (Borda's original memoir); and again, vol. iv., p. 441 ("Observations from Formentera to Usté").

Many modifications and improvements have been introduced into Captain Kater's method of determining the length of the pendulum, and we must refer to his paper (Phil. Trans., 1818, p. 33) for a minute description and for a plate of his apparatus.

The principle of his method is founded on the beautiful dynamical theorem due to Huyghens: The results have already been mentioned, noting that the axis of suspension and centre of oscillation are reciprocal in the same body. Now conceive two wedge-formed pieces of steel (knife-edges), with the sharp edges towards each other and parallel, to be fixed at equal distances apart, at any distance from the point of intersection of any four forms of plane, and in a line passing through its centre of gravity; then if the time of oscillation on either edge be the same, the distance between the knife-edges is the length of the simple pendulum which swings in the same time. Captain Kater, in his experiments, used a pendulum of an inconvenient form, the same nearly as in his invertable pendulum (see cut of Kater's invertable pendulum), with a second knife-edge below the centre of the bob, and there are several double points in the reductions which he employed and the results of the measurements. However, and in any case, his memoir must always be carefully perused by any future experimenter who wishes to make himself thoroughly acquainted with the subject. The method of observing the coincidences is remarkably ingenious and accurate. The best object for the purpose of measuring the length is that adopted by Mr. Baily. A C is a rectangular bar, with one knife-edge at each end, and the mark made at the other at B, about 1 of the length from the same point. A should be as near the end as sound workmanship will allow. The necessary verifications, namely, the parallelism of the knife-edges and the pendulums of equal length, are made, and P is the position of the bar, and that the line which joins the knife-edges passes also through the centre of gravity, are all very simple, and there is little difficulty in adjusting the oscillations on each knife-edge to synchrojism. The pendulum then is supported on agate planes in front of the clock, and the knife-edge being taken that the support is perfectly firm and the agate planes horizontal. A white disc of a spindle shape and exactly the width of the bars, and the flat end of the clock, and a telescope fixed in a line with the disc and bar, so that both being at rest, the white disc is just covered by the bar. Captain Kater used a diagram in his telescope, the sides of which were parallel to the length of the bars, and had its edges, but it has been found more convenient to place a pair of parallel plates between the bar and the disc, the sides of which are so adjusted as just to allow the disc on the clock to be seen between them. There is a divided scale to mark the arc of vibration, two or three thermometers hung at different heights about the pendulum bar to register the temperature, and a barometer for the atmospheric pressure, all which are to be read at the beginning and end of each series. The observer himself is of the simplest kind. Set the clock going, and when its arc is steady, give the pendulum a small motion, 1 or 2 at the utmost. The white disc, which is at first wholly visible, is gradually invaded by the bar, till at last it is entirely covered, first side and then the other, and the times of these intervals are to be noted. Almost immediately after, the white edges reappear, first on one side and then on the other, and these reappear-

ances are noted. The mean of the four gives the true time of coincidence. It has been found convenient practice not to make the adjustments with the highest degree of precision, for you are then in doubt whether the first disappearance and reappearance will take place, whereas if there is a very little displacement, attention need only be fixed on every alternate beam, which is a less strain on the eye and on the mind. This displacement however must be trifling, otherwise, when the arc becomes small, the disappearances and reappearances of the white disc are lost. It is not necessary that the experiments should be made on the clock, for the arc of vibration, the temperature, the buoyancy of the air and its inertia, and the height of the place of observation above the sea-level, are all to be made as in Borda's pendulum. For the details we refer to the standard memoir on the subject. However, and in any case, there are two or three points which deserve more attention than they have generally met with. The clock is only to be considered as a counter of the vibrations, and to avoid any error arising from its irregular rate, the observations should be continued without intermission between two epochs, at each of which the error of the clock is ascertained by astronomical observation. If this be done, the only reliance upon the clock is for the short time which elapses between the last coincidence of one series and the next of another. The whole of this observation requires artificial illumination, for it must be continued day and night. This is no disadvantage, but the contrary, for the other great practical difficulty is that of ascertaining the exact temperature and keeping it steady, the best place of observation being one of the deep rooms of the observatory.

The correction for the buoyancy of the air depends on the specific gravity of the pendulum; that arising from the dragged air, which we have called inertia, on its form. It is very probable that the experiments should be made on a vacuo, and where that is difficult or impossible, as in a travelling apparatus, the law and quantity of the correction for each pendulum should have been previously experimentally determined in a vacuo. The variation for temperature should be determined for each pendulum, and from its measurements at the same place. In addition to the height of the place of observation above the sea-level, a rough survey should be taken of the form of the surrounding country, and of the kind of strata, with the specific gravity of each. This is particularly necessary where the pendulum is considerable. (See Young's remarks, "Phil. Trans.," 1818, p. 93.)

Still, when every known precaution has been taken, there are anomalies in the results of this experiment which we are yet unable to explain. It has been found that the edge of the knife is perfectly straight and, to keep it so, if it is fastened to the bar. There is considerable uncertainty in measures of distance between the reciprocal knife-edges; and lastly there is no authorised standard of length at present existent in England. The length of distance can be expressed. The length of the simple pendulum which vibrates second in the latitude of London is not at present known with the degree of certainty which the importance of the problem demands, and which is attainable.

Captain Kater proposed the following form of pendulum for determining the number of oscillations which the same pendulum describes in different places, which is nearly the same as a nephew's above described. Mr. Baily suggests the bar with two knife-edges, the same as that used for determining the absolute length, and he directs observations to be made at each place with both knife-edges. There is certainly a great advantage in having a clock upon the knife-edges, and the decrease of deflection is supposed to expose the pendulum to have been previously given.

*Captain Kater's measure was doubtful in several respects, it has been partially corrected, it is still uncertain. He expressed the length of the pendulum in terms of Sir George Scheubner's scale (which has presumably been superceded by the standard yard), and this was later converted into a parliamentary measure declared to be standard by the 5 George IV., c. 75. The standard yard is 29.9 centimes, and the standard pendulum (to which this end of a pendulum is referred) is 39.2 centimes long. It must be remembered that this end must have been previously measured, and compared with the standard, and the best evidence of the parliamentary standard was a work done by the late Mr. W. R. Mackinnon, and the standard is, that is, by the length of the seconds pendulum, as it depends upon a fixed standard, it being necessary to make the measurement of the pendulum which was meant to be preserved. (Baily's Report on a second Asm., Soc. Sci. Mem., vol. ii., p. 55.)
lated) will show that one of the knife-edges has been injured. To ascertain which of the two it is, requires a second pendulum. Upon the whole, though we prefer Mr. Baily's pendulum to Captain Kater's, yet we think a form suggested by Mr. Airy is, for ordinary purposes, still better. Airy turned towards the pendulum a part of that part of the bar where the oscillations take place in the shortest time. In this case it seems probable that any ordinary injury of the knife-edge will not alter the time of vibration. The observer must be very careful in this, for it has been computed in its P. C. No. 1987, 1988.

Kater's Invariable Pendulum.

To Kater's pendulum. If the pendulum be set in motion by a steel knife-edge, it will be performed by any person the first time of attempting it, and an error of a second or two in noting the moment is a matter of little importance. There is far greater latitude for error in noting the temperature of the pendulum than in repeating a former observation. And, indeed, only attending the knife-edge pendulums, only partially understood at present, which is much more vexatious than temperature or clock-rate. As the pendulum swings about those points of the knife-edge which are in contact while deflection or movement, any imperfection in both, these points may be altered, when the axis of suspension, and consequently the time of oscillation, will be altered too. Hence it is advisable to place the knife-edge as exactly as possible always in the same position. Kater's pendulum is not liable to error in this respect, as it is a perfect pendulum, either of Kater's or Baily's construction. It is evident that in measuring the actual length of the pendulum this error may be further increased, for the pendulum assumes the perfect parallelism and truth of a pair of knife-edges. If Kater's pale pendulum be used, see 'Kater's Convertible Pendulum, with Young's Appendix,' Phil. Trans., 1818, p. 33; 'Kater's Invariable Pendulum,' Phil. Trans., 1819, p. 337; Sabine's 'Experiments to determine the Free oscillation of a pendulum.' Comm. p. 35. The measurement of the Length of Pendulum at London and Greenw ich, Phil. Trans., 1829, p. 83; Sabine, 'On the Reduction to a Vacuum,' Phil. Trans., 1829, p. 207; Baily, 'On the Reduction to a Vacuum,' Phil. Trans., 1832, p. 399; Foster, 'On the Reduction of the Length of Pendulum,' Dublin, Monthly Mag. Art. Soc. vol. vii. (at page 96, is given a table of the results of the most accurate modern pendulum experiments).

The last important measurement of the length of the pendulum, which is undoubtedly the most satisfactory, is due to the late Professor Sabine, who has most accurately measured the düngene einfachen Secundenpendel, Berlin, 1828, which forms part of the 'Transactions of the Academy of Berlin.' The principle of his measure is the same as that of Hatton's. Bessel procured from Paris a verified copy of the pendulum of this kind, and has been in the habit of using it in his P. C. No. 1987, 1988.

Pendulum 1 was then sent to the bottom of the mine, and set up with its clock and proper accompaniments. Pendulum 2 was established with its clock in a hut at the surface. We will call the observers A, B, C, D, E. A set off at six in the morning, commenced his observations, and carried with him his pocket chronometers with the object of reaching the second pendulum at the Ashgate before it went on the runs. As the clock and pendulum tend towards the sunny side of the hill, the time of 1 a.m. was the only one that could be found, which we can only attribute to the following cause:—In most of the pendulums hitherto made the steel knife-edge has been fixed upon a bar of different metal (brass and copper) with stout brass keys, and the two screws which fix the steel knife-edge to the brass keys are at some distance from each other. Now, if, from the difference of expansion between the brass keys and the knife-edge, the latter should be curved, not upwards or downwards, but in a horizontal plane, the consequent alteration of time in the pendulum which has come to rest after oscillating for a few seconds, the pendulum should either be controlled by being ground on a narrow slip let into a brass wedge, or the attaching knives should also be of steel. The uncertainty which appears due to some such cause as that above described may amount to a hundredth of a second per day. Pendulum 1 had ten times as much as twice, and Pendulum 2, five times as much as the tenfold difference of the pendulums, either of Kater's or Baily's construction. It is evident that in measuring the actual length of the pendulum this error may be further increased, for the pendulum assumes the perfect parallelism and truth of a pair of knife-edges. If Kater's pale pendulum be used, see 'Kater's Convertible Pendulum, with Young's Appendix,' Phil. Trans., 1818, p. 33; 'Kater's Invariable Pendulum,' Phil. Trans., 1819, p. 337; Sabine's 'Experiments to determine the Free oscillation of a pendulum.' Comm. p. 35. The measurement of the Length of Pendulum at London and Greenwich, Phil. Trans., 1829, p. 83; Sabine, 'On the Reduction to a Vacuum,' Phil. Trans., 1829, p. 207; Baily, 'On the Reduction to a Vacuum,' Phil. Trans., 1832, p. 399; Foster, 'On the Reduction of the Length of Pendulum,' Dublin, Monthly Mag. Art. Soc. vol. vii. (at page 96, is given a table of the results of the most accurate modern pendulum experiments).

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error of 4th of a second. After finishing his first series and commencing a second, A returned to day (in the miner's language, to grase*). This series was completed by B, who set off at 2 P.M., made a third shorter series, and commenced a fourth. The night-work was taken by C or D, one of whom decended at 10 P.M., finished B's series, and commenced a fresh one; on his return to day he finished the upper series which E commenced before going to bed, and started another, which was finished by A before his next visit. This was the usual way of proceeding. Precise time was taken from Monday morning, July 11, to Saturday afternoon (127 hours). On comparing the results of each day, it was found that the three first days agreed extremely well, showing an acceleration of about 29 per day in the lower pendulum; but the two next days, this series being about double that. The only mode of accounting for this unexpected and very unwelcome result was, that the knife-edges and agate planes were imperfect, and that the time of oscillation depended on the position of the pendulum on its plane. This had never before been reduced to so rude a form as falters if the pendulum was at that time almost an article of faith among experimentalists. To ascertain this a second series of comparisons was made between pendulum 1 and 2, taking care to place the knife-edges exactly in the same position on their planes, and that the faces were turned the same way. These comparisons were necessarily hurried, as a slip had taken place in the mine near the engine-shaft, which deranged the action of the pumps, and forced the experimenters to repeat their operations below without delay. Pendulum 1 was again set off, and on the same side, and observed on the lower plane above, for three days (79 hours), until the underground observers were driven out by the water. Notwithstanding all the precautions which had been taken, the observations of the last day gave a different result from the two first. The comparison of the pendulums was then made in an unavailing form, that, even with the care and attention they had used, the pendulum could not be trusted. The pendulums were a third time compared with each other above ground, and the intervals of comparison were incommensurate, from 20° 24' to 20° 17', and back again from 20° 20' to 20° 29'; and finally, during one series of oscillation, without being touched, or any one entering the room, the time of coincidence changed from 20° 17' to 20° 18', and still further, so that it is therefore clear that while the mode of observing was perhaps sufficient to detect a difference of a hundredth of a second a day (except from the effects of temperature, which might amount to a tenth of a second), the pendulums themselves, though the only sources of the utmost skill and precaution, and under the same circumstances, were liable to errors of two seconds or more per day. PENELOPE (Ornithology). [Cricidæ, vol. viii., p. 137.] PENETRATIS, De Montfort's name for a genus of microscopic Foraminifera. PENGUINS. [Thesalv.] PENGUINS, Manchots of the French, a group of natural birds, in which the wing, powerless as an organ of flight, is converted into a structure wholly for swimming. They seem to be among the Nautes or the Struthiones, a single genus to be, according to Prodigiously active in water, but helpless on the land. Their lot has been wisely cast on those desolate southern islands and shores where man rarely intrudes, and in many instances where a churchill climate or a barren soil offers no temptations to him to invade their territory. They seem to occupy in the southern hemisphere the place filled by the Auk in the northern portion of the globe. Before we enter into the details of the organisation of these birds, or an inquiry as to the views of Ornithologists relative to their proper place in the system, it will be necessary to notice the various accounts of the habits of this very curious and interesting group. Le Vaillant, in his account of his investigation of the remains of the tomb of the Danish seacaptain, as noticed in the article PELICANUS, found that the smaller crevices of the rocks served as places of retreat for Pinguins (Sphenornis, probably), which swarmed there above every other kind. This bird, says Le Vaillant, which is about as long as the man-of-war, length, does not carry its body in the same manner as others: it stands perpendicularly on its two feet, which gives it an air of gravity, so much the more ridiculous, as its wings, which have no feathers, hang carelessly down on either side; it manoeuvres, however, as if it were in swimming. As advanced towards the middle of the island, we met innumerable troops of them. Standing firm and erect on their legs, these animals never turned themselves in the least to let us pass; they more particularly surrounded the man-of-war, and we had to force our way through a sort of terrestrial traveller, and I gave him the tribute of a sigh. Sir John Narborough says of the Patagonian Penguins, that their erect attitude and bluish-black backs contrasted with their white bellies might cause them to be taken at a distance for samples of the land. These Penguins are sometimes called schamps, and rookeries, as they have been called, of these birds, have proved an ample theme for most of the southern voyagers. Those at the Falkland Islands have attracted particular attention; and several of the abandoned huts are described as giving a dreary, not to say awful, impression of the place and the utter absence of the human race. In some of the towns, it is stated, there was a general stillness, and when the intruders walked among the feathered people, the egrets and pigeons, that were regarded with side-long glances, but they seemed to carry no fear with them. In many places the shores are covered with these birds, and three hundred have been taken within an hour; for they generally make no effort to escape, but stand perfectly still, and are thrown down with sticks till it comes to their turn. Cook, speaking of the islands in the high latitudes of the South, describes the cold as intense; the islands were covered with hoarfrost and snow, neither trees nor shrubs appeared, and he saw no living thing. That the last being so numerous that they seemed to encrust the coast. Some describe the rookeries as designed with the utmost order and regularity, though they are the reot of several different species; a regular camp, often covering three or four acres, is laid out and maintained, and the ground disposed in squares for the nests, as accurately as if a surveyor had been employed: their marchings and counter-marchings are said to remind the observer of the manoeuvres of soldiers on parade. In the midst of this apparent order, there is no attempt to be, according to von Martens, not very good government, for the stronger species steal the eggs of the weaker, if they are left unguarded, and the King Penguin (Aptenodytes Patagoniea) is the greatest thief of all. Three species are stated to be found in the Falkland Islands: two of these, Aetoneon and Arcton (Aptenodytes chrysopheca) deposit their eggs in these rookeries. The Jackass (Aptenodytes demersa), which is the third, obtaining its English name from the hornie braying which it sets up at night, makes its nest in burrows on the sea shore, and the sandly plains of the continent serve as an invasion so quietly as the other species. This, we conceive, must have been the penguin noticed by Forster, who describes the ground as everywhere so much bared, that a person in walking often sinks up to the knees; and if the ground be in the least uneven, there is no need of destroying the passenger by fastening on his legs, which is always done by the passenger.
King Penguins (Aptenodytes Patagonica) recorded by Mr. G. Bennett, who saw at the north end of Macquarie Island, in the South Pacific Ocean, a colony of those birds which covered an extent of thirty or forty acres. He describes the number of Penguins collected together in this spot as immense; but observes that it would be almost impossible to guess at it with any near approach to truth, as, during the whole of the day and night, 30,000 or 40,000 are continually being added to the island, among which they are so closely arranged, when on shore, in as compact a manner and in as regular ranks as a regiment of soldiers; and are classed with the greatest order, the young birds being in one situation, the molting birds in another, the sitting hens in a third. The fourth, which is the most interesting, is the state in which the birds in similar condition congregate, that should a bird that is molting intrude itself among those which are clean, it is immediately ejected from them. The females hatch the eggs by keeping them close between their thighs; if an attempt be made to take them away, carrying their eggs with them. At this time the male bird goes to sea and collects food for the female, which becomes very fat. After the young is hatched, both parents go to sea, and bring home food for it as soon as possible. It is as necessary for the old as it is for the young. They sit quite upright in their roosting-places, and walk in the erect position until they arrive at the beach, when they throw themselves on their breasts, in order to encounter the cold winds. They are sometimes seen at night, with their heads up in the air, as if they were harbouging the penguinry, while the young one stands close to it, but a little lower. The old bird, having continued its clatter for about a minute, puts its head down and its neck a little, and then appears to suck from the throat of its mother for a minute or two, after which the clatter is repeated, and the young one is again fed; this continues for about ten minutes. I observed some which were molting, but I should not have suspected it of them, so quiet and so perfectly concealed were they. Nothing less than heavy blows would have stopped them; every inch gained he firmly kept, standing close before me, erect and determined. When thus opposed, he continually rolled his head from side to side, in a very odd manner, as if in the manner of vision and hearing of each eye. This bird is commonly called the jackass penguin, from its habit, while on shore, of throwing its head backwards, and making a loud strange noise, very like the braying of that animal; but while at sea and underwater, its note is very deep, and is often heard in the night-time. In diving, its little plumless wings are used as fins; but on the land, as front legs. When crawling (it may be said on four legs) through the tussocks, or on the side of a rocky cliff, it is so very quiet that it might easily be taken for a quadruped. When at sea, and fishing, it comes to the surface, for the purpose of breathing, with such a spring, and dives again so instantaneously, that I defy any one at first sight to be sure that it is not a fish leaping for sport. ( Voyages of the Adventure and Beagle."

Bougainville endeavoured to bring home a penguin alive; it became so far tame that it followed the person who fed it: it ate bread, flesh, or fish; but its fear appears to have been the same as that of a inefficient or old shooter. However, we have sometimes thought that the Four-footed Duck of Gesner might have owed its origin to an ill- preserved penguin, and the notion of its being four-footed might have been fortified by some voyager who had seen the bird making progress as Mr. Darwin has above described. It is a larger figure than Gesner's, headed 'Cane à quatre pieds,' in the Portraits d'Oiseaux. Both are evidently much indebted to the imagination of the artist.

An elaborate dissection of an adult male Patagonian Penguin, Aptenodytes Patagonica, Forst., the total length of which, measured over the back, was three feet two inches six lines, is given by Mr. Reid. The whole will well repay every one who is interested in pursuing it; but our limits will allow us to give little more than a portion of the description of the oesophagus. The specimen was captured at East Falkland Isle, lat. 51° 32' south.

Mr. Reid describes the bones as very hard, compact, and perfectly dry, having the compactness with which very dry bones present. They contain, especially the bones of the extremities, a thin oily marrow. The foramina for the transmission of the blood-vessels of the bones are small. The peristium is thick and fibrous. The crusium is short and broad, and is separated into a small joint. The vault or harmony; superiorly, it is flattened; posteriorly, towards the occiput, it is rounded; it declines obliquely forwards and backwards when it attains the front of the orbit it is suddenly truncated to meet the superior mandible. The orbita are large, and separated by a membrane. There is in each orbit there is a fossa, which is deeper and broader behind than in front, and which ends suddenly at its union with the orbitar process of the temporal bone. External and inferior to the termination of the transverse ridge of the occipital bone there is a process. The temporal bone has two processes: the tympanic, situated immediately anterior to the last-named process; and the orbitar, situated immediately behind the posterior part of the orbit. The basilar process of the occipital bone is short, ending posteriorly in a single round prominent condyle. The atlas is small, soft, and cartilaginous. The body of the sphenoid is lengthened, and its pterygoïd processes form separate bones. The tympanic bones have the internal process much produced. The jugular foramen is very large. The ossa are large and thin, attached, as usual, to the tympanic and superior maxillary bones. The palatine bones are long and thin, meeting posteriorly the pterygoïd, and anteriorly the superior maxillary bones.

The upper jaw is immovable; the superior mandible long, slender, and a little arched at the point. The articular processes for the nostrils are long and narrow. The bones of the superior mandible are of the usual form. The superciliary bones are wanting. The lacrymal bones are small, and fixed to the cranium. The turbinate lumina are small, soft, and cartilaginous. The lower jaw is long and slender, and composed of three pieces, viz. the body of the bone and its two articulating portions. The coronoid processes are very small. The condylar process is not elevated above the body of the bone. The articular process is produced posteriorly for the attachment of the pterygoïd muscles.

The ox hyoideus has the lateral cornua much lengthened, passing upwards posteriorly to the occipital bone, then curved forwards for a short distance upon the temporal bone. The vertebral column consists of:

- Cervical vertebrae: 13
- Dorsal: 9
- Sacral: 12
- Caudal: 8

In all 42

The ribs are nine in number, and of the usual form; the two upper ones are not connected with the sternum. The oblique processes are situated halfway between their verte.
bral and sternal extremities. They commence cartilaginous at the inferior margin of each rib, and are about five lines broad at their origin; towards their termination they spread laterally to the width of one inch. As they approach the lower rib they get gradually thinner. In the first and last rib they are totally wanting. The last rib, at its centre, has a surface concave externally, produced by the action of the thigh. The sterno-costal bones are seven in number, the third of which is large, and forms one end of the "sternum". The long bone is much developed at its top, and forms a very neat angle posteriorly, terminated by a small line. The space for the attachment of the middle pectoral muscle is considerably larger than the corresponding space on the other side, which has a similar, although usual apophyses, are very large. The coracoid bones are long, strongly formed, and smooth anteriorly; the margin much produced at the superior internal edge, and the ends forming a common surface with the humeral processes, extending upwards and downwards. The superior and inferior edges of each side of the keel there is a large space, terminating inferiorly in one, owing to the shortness of the middle layer compared with the lateral ones. The keel terminates abruptly inferiorly. The ensiform process has a ridge in the middle, along which and the inferior edge of the bone a membrane was attached (which separated in macceration). The external layers of the bone are, as has been already incidentally noticed, much longer than the middle one; they curve inward toward each other, and are tipped with cartilage externally. The coracoid bone is inserted in the large groove that runs from the external to the internal coracoid process, and the scapula, about three-fifths of the cubitus being formed by the os coracoideus. Each clavicle is turned downwards, and is broader near the coracoid bone, and tapering to the front, where there is a protuberance formed by the junction of the clavicles: this protuberance does not touch the sternum. Posteriorly they give off a flat conical process, which goes down internally to the coracoid bone, and is united to the bone posteriorly on the posterior part of the scapula, immediately inferior to its head. The scapula is remarkably broad and thin; its neck and head rounded. There are three articulating processes in this bone: one with the furculum; another with the coracoid bone; and the third with the humerus, forming the head of the bone. The bones with the sternum of some nearly-allied Birds, less development of the keel is found in the Loom, and less development of the lateral wings in the Auk, and more in the Steamer. The differences are shown by tables given in Mr. Rees's paper.

The humerus is much flattened. On its posterior aspect there is a large foramen, situated under and occupying the whole of the internal part of its head, which is in form crescentic at its distal extremity, posteriorly inferior to the posterior part of it a groove passes. The distal end of the bone has two tubercles for articulation. There are two prominent trocheeae on its posterior surface, on which work the two sesamoïd bones of the elbow-joint. The form of the larger of these is flattened, and of the smaller trapezoid, with truncated edges.

The ulna is very thin and flat, not quite so long as the humerus, rounded slightly at its upper extremity, and still less than its lower one. Its head has a cavity, which receives the posterior tubercle of the humerus, and posteriorly to this is a prominence on the posterior margin, to which is attached the ligament of the two sesamoïd bones. The superior ulno-radial joint admits of little motion, being composed of a plane and a plane face. Near the distal extremity of the bone there are several ridges, on which the attachment of muscles. The distal articulating surfaces are three: one with the radius anteriorly, another with the first carpal bone inferiorly, and the third with the second carpal bone, which is slightly downturned.

The radius much resembles the ulna in shape. At its head it has two articulations: one superiorly, with the anterior tubercle of the humerus; and the other posteriorly, for articulation with the ulna. There are likewise two articulations on its distal extremity: posteriorly one with the ulna; and inferiorly there is another with the first carpal bone. Near its neck is situated a process for the attachment of muscles. On its superior anterior part a groove runs obliquely, from before backwards, and from above downwards. At the distal extremity there is a similar one. It running in a contrary direction, that is, from behind forwards.

The first carpal bone has the form of a trapezium, with three articulating surfaces: a superior one for the radius; a posterior one for the ulna; and an inferior one for the metacarpus. The articular surfaces are all regular, with articulating processes, and a notch on its inferior edge; one anteriorly for the ulna, the other inferiorly for the metacarpus.

The metacarpus is composed of a single bone, formed by the union of its elements. The anterior of the two metacarpal bones supports two phalanges of the first finger, and is twice the size of the posterior one, which supports the single phalanx of the second finger. The upper end is crescentic, articulated with the first carpal bone anteriorly, and with the second by a thin cartilage, which is a sulcus between the ends of the two bones, at their inferior extremity. The first phalanx of the first finger is a long, broad, and flat bone, tapering gradually from above downwards, united to the metacarpus by a flat surface, and connected with the second phalanx and proximal phalanx of the second finger. The phalanges is broad and flat, tapering from above downwards. By a similar articulation is attached to the posterior metacarpal bone a phalanx, which is flat, long, and tapering from above downwards, it gives off a process which passes upwards for a short distance on the posterior part of the metacarpal bone. The bones of the pelvis are so much shortened behind, that they throw the centre of gravity in a perpendicular line with the head. The ilium is volarly, and on the ventral side of the ilium, the acetabulum is one-third of the length of the body of a Gull (Larus), one half in the Loon, and not quite one-fourth of the length of the trunk in the Petrel Conuent. The sacro-sciatic notch is a complete foramen. The pubic bones are long and double: the anterior part is downwards, and tipped with cartilage. The cotyloid cavity is a perfect foramen, with a large process at its posterior-internal part tipped with cartilage, and articulated with the trochanter major. The thyroid foramen is not complete, except by the intervention of a ligament which separates it from the obturator foramen. As there is no iliacus internus, the superior part of the os ilium extends upwards, and lies close to the ribs. The os femoris is formed as usual, the head being flattened anteriorly, the neck short and thick, the trochanter superiorly turned backwards and tapers, and is articulated with the process on the ilium. Besides the posterior there is also an anterior linea aspera. There is a process external to the external condyle, having its inferior surface covered with cartilage, which acts as a pulley. On its inferior external surface there is a sharp edge. The condyles are not much everted.

The shape of the patella is peculiar. There are two articulating surfaces posteriorly: one which would form part of the large crescent, and which has a prominent for the condyles of the femur in its centre; the other, inferior, is likewise crescentic; it is very narrow, and articulated by liga-
tments to the tubercle of the tibia.

The superior surface of the femur has a crista in its centre, of an ovoid form; the posterior edge truncated. The internal surface is perfectly flat; the oblique slightly marked with a ridge, and looks downwards. There is a groove on the centre of the anterior edge, which also passes obliquely downwards on the external side: these two sides are truncated at their extremities. The tibia is nearly twice the length of the femur; the tubercle is elevated above its head, and forms a broad short conical truncated process. On the anterior part of the head there is a large groove, deepest at the top, and extending along the internal line. The floor of this groove is here smooth, for articulation with the fibula. It has inferiorly two condyles, articulated with the metatarsus, having a foramen above and between them for the transmission of tendons. The fibula is in the form of a lengthened cone, and is attached to the outer surface of the tibia; for about two-thirds of its length it is anchoyed to bone inferiorly. It has the usual quantity of surfaces for the attachment of muscles.

There is no tarsus.

The metatarsus has two articular depressions on its pos-
terior surface, for the reception of the condyles of the tibia. It represents three pulleys for articulation with the phalanges. On the inner part of the superior face is situated the metatarsal bone of the first toe, connected by ligaments to the large bone. There is a fossa on the superior surface, between the first and second metatarsal and the third bone of the metatarsus: this gradually decreases in size and increases in depth, till it perforates the bone, and joins the fossa on its inferior surface, where, immediately anterior, internal, and inferior to the outer depression on its head, there is a large protuberance, forming the inner boundary to a groove. The phalangeal end is formed as in most Birds. The first toe, which is the smallest in the foot, has three bones, all of which are flattened, and have simple articulations, the last one having a nail. The metatarsal bone is only connected to the others by muscle: the whole length of the toe is one inch; the second toe has three phalanges, the third has four, and there are five belonging to the fourth toe. All are formed as is usual in this class.

The ligaments of the head and trunk are of the usual form.

In addition to these, a ligament arises from the sesamoid bones of the elbow-joint, which passes to the external or dorsal side of the furca, where it is tied down; it again passes forwards, and is attached by separate slips to the joint and head of the first part of the metatarsus and to the first phalanx of the first finger, and is inserted into the second about three lines from its head. The ligaments of the hip-joint are as usual. Besides the usual ligaments of the knee-joint, there is one which arises together with the cruciate, and is attached to the patella, half way down the central line. The form of the semilunar cartilages is crescentic, with prolonged horns. The ankle-joint has semilunar cartilages of the usual form. There are superior and inferior annular ligaments belonging to the metatarsus. In no other instance is there any deviation from the usual form.

There is a very large bursa situated within the knee-joint.

The muscles were of a dark red colour, very tough, and having a great deal of cellular membrane amongst them. The fascia were very thick and strong. In no instance did Mr. Reid observe any tendency to ossification in the tendons. In the tendons of the perforatus of the first and second toes there was a sesamoid bone, scarcely equalling in size a mustard-seed. [Zool. Proc., 1836.]

The sensations of these curious birds do not seem to be very acute. Sparrman relates that he stumbled over a sleeping one, and some yards without disturbing its rest, and Forster states that he left a number of them apparently lifeless, while he went in pursuit of others; but they afterwards got up and marched off with their usual gravity.

Mr. Vigors enters the family of Alcedo by means of the genus Uria [Guillaumot], which it contains, as also Ales and Aiptenodytes of Gmelin. 'The latter genus,' says Mr. Vigors, 'apparently carries to the extreme the typical character of those groups in which the wings, becoming gradually shorter, and less furnished with feathers, lose at length all their powers of flight, and assume the functions of fins instead of wings, to assist the bird in its progress through the water. The whole of the family before us, united by the form of the foot, is separated into generic groups by the different shape of the bill. And here a beautifully progressive series of affinities is apparent, throughout the whole group. Beginning from the true Aiptenodytes, we may observe that the bill of that genus is long, rather slender, and somewhat curved; while that of Catarhaces, Briss, which succeeds, is shorter and more elevated at the ridge: thus leading the way to Spheniscus, Briss, where the sides are compressed, and the culmen elevated into an edge; a structure, as the same member in the true Alce [Auk], in which the sides are still more strongly compressed, and the culmen more elevated. The Proterocula, Briss, the well-known Podiceps of our rocky coasts, following Ales, exhibits the extreme of this singular construction; and there cannot be a more interesting subject of contemplation to him who may wish to witness the mode in which nature harmonises her groups, than the gradual change of form that unites the short and elevated bill of this last genus with the long and slender bill of Aiptenodytes. A similar gradation of affinities between conterminous groups leads us back again to the point from whence we started. Some species of the Linnean Ales, which M. Temminck has united under the generic title of Phaleria, with bills less elevated at the culmen and more tapering than that of Proterocula, lead us generally to the Margarula of Ray, the Little Auk of our cabinets. This genus strongly and distinctively separated from both Ales and Urria, in the former of which it has been placed by Linnaeus, and in the latter by M. Temminck, may be considered as intermediate between them. It thus brings us to Urria, where the pointed and tapering bill, again discernible, conduces us to Aiptenodytes.' Mr. Vigors, having then observed that the groups composing the Alcedae are characterised by having no hind toe, passes from them to the Pelicanidae by means of Aiptenodytes. [Pelicanidæ.]

Mr. Swainson observes that the hind toe in the penguins and cormorants is placed almost as forward as in the swifts. In the penguin, the tarsus is so short as almost to be conspicuous, and the foot is probably rested upon the ground for its whole length when the bird walks, just as in the bear and other plantigrade quadrupeds; it is also, he adds, remarkably broad; the hind toe is placed in front, and on the inner margin; but it is so unusually small, that, but for its short but well defined claw, it would not be perceived. This claw is without any vestige of a web, or of a lobe, and is quite disconnected from the others; of the three anterior toes, the middle is the longest, the outer rather less, and the inner the shortest. The whole foot is remarkably flattened, as if to enable the bird to cover a greater breadth of ground. (Classification of Birds, vol. 1.)

In the second volume of the same work, the author, after a summary discussion of the family Alcedo, considers the penguins, on the whole, as the most singular of all aquatic birds, and he states that they clearly point out: that nature is about to pass from the birds to the fishes.

We own that this is not quite so clear to us. Among the terrestrial birds we regard the Struthionidae as presenting the most erectoid form; and an examination of the organization of the penguins leads us to the conclusion that they more satisfactorily represent some of the aquatic reptiles, especially the marine Testudinidae. M. Lesson thinks that Apt. Patagonica leads to the mammifers by Ornitho Rhynchus. The Alcedo of Mr. Swainson consist of the genera Urria, Ales, Mormon, Chimerinae (Schn.), Phaleria,
and Arentodytes. The family is placed between the Colymbidae and the Pelecanidae.

According to Mr. G. R. Gray, the genera of the Alcidae are subdivided into the subfamilies Alcinae, Phalaeinae, Sphenicininae, and Urisinae.

The Sphenicininae comprehend the genera Sphenicus, Briss.; Eudyptes, Vieill.; Pygoscelis, Wagler; and Arentodytes, Forst. (List of the Genera of Birds, 1840.) Specimens of each of these genera are to be seen in the British Museum.

Sphenicus. (Briss.)

Generic Character.—Bill compressed, straight, irregularly furnished at the base; end of the upper mandible hooked, that of the lower mandible truncated; nostrils median and exposed. Wings improper for flight.

Example, Sphenicus demersus—Arentodytes demersus, Gm.

Description.—Bill and feet black; the former with a yellowish transverse band near the apex; eye brown and pectoral band white; body above black or black-speckled; white beneath.

Geographical Distribution.—The South Seas, Atlantic and Antarctic. In great abundance at the Falkland Islands and Cape of Good Hope.

Eudyptes Chrysocebes. (Cataractae, Briss.)

Generic Character.—Bill straight at the base, compressed, furnished obliquely, pointed, rounded above, upper mandible hooked, lower mandible rounded or truncated at the point; a furrow originates from the nostril and terminates at the lower third of the border. Wings reduced to rudiments, improper for flight.

Example, Eudyptes Chrysocebes—Arentodytes Chrysocebes, Gm.

Description.—Bill reddish-brown; frontal crest, consisting of very narrow loose feathers, black and erectile; auricular band deflected, sulphureous. Body, above bluish-black, below velvety-white; wings black above, white below; feet yellowish.

This is the Crested Penguin of Latham; Mouchot Souterrin of Bourcaille and Buffon.

M. Lévy has given a good account of its habits, as well as those of other species of the genus, in the Zoologie de la Coguelle. He states that it lives in all the seas of the southern hemisphere, far from the land; for he killed individuals in 43° 6′ 43′′ S. lat. and 56° 36′ 49′′ W. long., voyaging in couples, doubtless male and female.
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PEN

The sides: toes strong and robust; wings more elongated than in the other penguins. Height, when erect, upwards of three feet.

Local Distribution.—Southern hemisphere in high latitudes. Strata of Malabarba; Falkland Islands, Antarctic Islands, &c. Weddell (Voyage to the South Pole) gives a highly interesting account of the habits of this species.

The forms above given will, it is hoped, sufficiently explain to the student the group before us. The type of the genus Pogonias of Wagler is Aplonotus Papua of Gmelin, an inhabitant of Papua, or New Guinea, among other localities.

Corinalla. [Pseudozoria.]

PENICILLUS, Bruguiera's name for the Aspergillum of Lam. [Aspergillum; Tubericola.]

PENITENTIARIES. [Prisons.]

PENJAB, or PANJAB. [Hindustan.]

PENKIRDE. [Staffordshire.]

PENMAEN MAWR. [Carnarvonshire.]

PENN, SIR WILLIAM, was born in 1621, at Bristol. He was a Quaker, of which it was said he was of own opinion, with republican government on the charge of having left his command without leave. After the Restoration he was created a knight, and was made a commissioner of the navy, governor of Kinsale, and a vice-admiral. He again went to sea, and carried on the war till 1665, when his father died, and he was left in possession of his estates, and in 1666 he retired from service at sea, but continued to perform his other duties till 1669, when he went into retirement at Woburn Abbey, in his own county.

PENN, WILLIAM, the only son of Admiral Penn, was born in London, October 14, 1644. He was educated with much care at Chigwell in Essex, and then at a private academy in London. In 1660, he was entered a gentleman commoner at Cambridge, and till 1665, when his father died, his first bias towards the doctrines of the Society of Friends, or Quakers, as they are commonly called, appears to have been produced by the preaching of Thomas Loe; the effect of which was, that, while at Oxford, Penn, together with some of his fellow-students, resolved to escape to London, to which city he returned, and there associated himself with the public worship of the established church, and to hold private prayer-meetings. They were fined by the college for non-conformity, but this did not deter them; for, an order from the king having required that the ancient custom of wearing Sunday clothes should be observed, they attempted to tear them from the backs of those students who wore them. For this display of intemperate zeal they were expelled from the college.

Admiral Penn, who was in high favour with Charles II. and the duke of York, and ambitious for his son's advancement at court, was much displeased with this event, and still more with the change which had taken place in his son's manners. He tried to turn him from his religious observances and company, but in vain, and at length was so highly incensed as to have recourse to blows, and finally turned him out of doors. The admiral soon relented so far as to try another expedient. He sent him, in 1662, on a tour to France. After remaining a considerable time in Paris, Penn went to Saumur, and studied under the famous Pierre Moreau. He afterwards proceeded to Turin, whence he was recalled by his father to England, in 1664, who, on his return, was greatly pleased with the polished and courteous manners in which he had acquired. He was now admitted a student of Lincoln's Inn, and was sent to Ireland, for the purpose of managing his estates in that country. This duty he performed to the entire satisfaction of his father; but, happening to attend a religious meeting at Cork, where Thomas Loe dealt with the territory lying round about the world, and there is a faith that is overcome by the world, he was so deeply impressed, that from this time he began to attend the Quakers' meetings. At one of these, held at Cork, in 1667, he and others were apprehended by order of the mayor, who would have set Penn at liberty on his giving bail for his good behaviour, but he refused, and was sent to prison with the rest. He wrote however to the earl of Orrery, then lord president of Munster, begging his intercession, and he permitted himself with ordering Penn alone to be set at liberty.

Admiral Penn, on being informed that William had decidedly joined the Quakers, summoned him home, and re-confirmed with him and threatened him, but in vain. the son was firm, but respectful. The admiral at last restricted himself to the demand, that he should take off his hat in the presence of the king, the duke of York, and himself. But Penn refused to pay even this limited degree of 'hat worship,' at which the admiral was so much incensed that he again turned his shoulders out of doors; but in a short time he allowed him to return home.

In 1668 Penn began to preach, and also published his first work, 'Truth exalted.' In this year, a preacher named Vincent accused the Quakers of being opposed to the doctrine of the Trinity, and objected to the language in which he was described by the church. The court took no notice of this for he was committed to the Tower. During his imprisonment, which lasted nearly seven months, he wrote his 'No Cross, No Crown,' one of his most popular works. In 1669, after his liberation, an entire reconciliation took place between himself and his father, and he went to London to look after his father's estates, in which country he remained about twelve months.

In 1670 the Convention Act was passed, and Penn was one of the first sufferers under it. He was committed to Newgate for publishing a 'seditious assembly,' which consisted of the Quakers, who had been excluded from their chapel, and who now met in the open street, as near to it as they could. The trial took place at the Old Bailey Sessions in 1670, and the only witness for the prosecution was one of Penn's defence, but for the admirable courage and constancy with which the jury, in opposition to the direction of the Bench, and in defiance of its threats, pronounced a verdict of acquittal. The jury were determined to be immovable, and so his case was paid; but this proceeding was declared illegal by the Court of Common Pleas, on which occasion, chief-justice Vaughan delivered an able speech in defence of the rights of Juries. Soon after this Admiral Penn died, perfectly reconciled to his son, and the Quakers, who were oppressed by Exchequer prosecutions under statutes which had been enacted against the Roman Catholics; he was also admitted to plead before a committee of the house, that the solemn affirmation of the Quakers should be admitted in the place of an oath, and to this effect an enactment passed the Commons in 1678, but was lost, in consequence of a prorogation, before it had passed the Lords.

We now come to an important event in Penn's life, the establishment of the colony of Pennsylvania. A tract of country on the west of the Delaware, was purchased from the Indians by petition of Charles II. to Penn and his heirs, in consideration of a debt of 16,000l. due from the crown to Admiral Penn, for money advanced for the service of the navy. To this the duke of York added by cession a contiguous portion of the territory lying round about the world, and this petition was dated March 4, 1690-1, and in this document he named the province, in honour of the founder and his father, Pennsylvania. Penn was constituted absolute proprietor and governor of the province. He published 'Some Account of Pennsylvania,' &c., and also 'Certain Condi-
tions or Concessions, &c., in which no offered easy terms of settlement to those who might be disposed to emigrate. Three ships were sent sail with settlers from England and Wales, chiefly Quakers. In the beginning of 1662 he published 'The Frame of the Government of the Province of Pennsylvania in America, together with certain Laws agreeable to the experimental success of the aforesaid Province, to be further explained and confirmed there by the first Provincial Council that shall be held.' Having previously opened a friendly intercourse with the native Americans by present and conciliatory measures in the summer of 1661, he sailed for Pennsylvania, leaving his wife and children in England, and soon after his arrival summoned an assembly of the freemen of the province, by whom the frame of government, as formed in England, was accepted. The Governor was made President of the Council, and left England with instructions to negotiate a treaty of sale with the Indian nations, and tradition records that a great meeting of the Indian nations and European settlers took place under an enormous elm-tree, near the site of Philadelphia, when the treaty was ratified. According to Rush, it was 'the first blow struck at the English' policy of 'bullying to the point to the risk of being shipwrecked,' says Proud, the historian of Pennsylvania, 'which, for the space of more than seventy years was never interrupted, or so long as the Quakers retained power in the government.' The exact date of this memorable assembly has not been specified.

Having founded the city of Philadelphia on the banks of the Delaware [Philadelphia], and spent about two years in the province adjusting its political constitution, and bringing the colony into a state of prosperity and order, he returned to England in the summer of 1663. Latin historians give no short period less than fifty sail arrived in the province with settlers from England, Ireland, Wales, Holland, and Germany.

In February, 1685, soon after Penn's return to England, Charles II. died, and the favour with which James II., when duke of York, had regarded Admiral Penn, was transferred to his son. After the Revolution in 1688, his intimacy with James II. exposed him to suspicion, and he was four times arrested on accusations of being a Jacobite. Pembroke's friends, who always stood by him, and visited him in prison, would not let him be convicted upon the oath of such a man, and the perjured evidence which he might get up, he lived in great seclusion in London till 1693, in which year, through the mediation of his friends at court, he was admitted to plead his cause before the king, and there, he always stood by the king and council, till one Fuller, who was afterwards declared by parliament to be an impostor, in 1690 accused him on oath of being concerned in a plot to restore the late king to the throne. He was then always on his trial, and was at last convicted. Soon after this his wife died. In 1696 he married Hannah, the daughter of Thomas Callowhill, a merchant of Bristol.

In 1699 he again sailed for Pennsylvania, with his wife and family, with the intention of making it the place of his future residence. He was always well received in Pennsylvania, and had been permitted to reside in it, and had been annexed to that of New York; but it was restored to him in 1694 by an instrument of William and Mary. An attempt was afterwards made to take possession of the proprietary government in North America, and to convert it into royal ones. A bill for this purpose was already before the lords, when it was delayed by petition of the friends of Penn, who immediately embarked for England, where he arrived in December, 1701. The bill was dropped after his return, and the fine was remitted; but he remained in Pennsylvania until 1703, at the behest of his wife, to favour at court. In the meantime Penn had become encumbered with debt. He had mortgaged Pennsylvania in 1708 for 68,000l. In 1712 he agreed to sell his rights to the buying government for 12,000l. to complete the transaction by three annuities which followed each other in rapid succession, and considerably impaired both his memory and understanding. He survived however in a tranquil state, though with his bodily and mental vigour greatly declining, till the 30th of July, 1718, when he died, at his seat at Rousham in Berkshire.

Penn left children by both of his wives, and to them he bequeathed his property in Great Britain and America. The government and quit-rents of Pennsylvania devolved upon the surviving sons of the second family, with the title of Proprietaries, and by them were sold to the state of Pennsylvania, after the American Revolution, for 130,000l.

Penn's writings, which are numerous, were collected, and published, with a Life prefixed to them, in 1725, 2 vol. folio.

(Clarkson's 'Life of Penn; Sewell's 'History of the Quakers; Proud's 'History of Pennsylvania.')
which he noted down all the objects of interest that he met with, and published it after his return, with plates illustrating the scenery, &c.; this work went through many editions. He made a second excursion into Scotland in 1772, of which he also published an account. He was accompanied in this tour by Dr. Lightfoot, who then collected a great part of the materials for his 'Flora Scotica,' in the preparation of which Mr. Pennant was of great assistance to him.

The next work which Pennant commenced was a systematic catalogue called the 'Genera of Birds;' this was intended to be similar in plan to the 'Synopsis of Quadrupeds,' but it was never completed. His last great work was his 'Arctic Zoology,' which appeared in three quarto volumes in 1784-85-87, and contained twenty-six plates. This (which was necessarily a compilation, as the author never visited the native haunts of the animals which he described) included an account of the northern coast of Europe, Asia, and America, with their productions, taken from the writings of different travellers, and from the examination of specimens of different animals sent to the author or preserved in museums. Pennant received considerable assistance during the progress of this work from many foreign naturalists, among whom Pallas, Thunberg, Sparman, Müller, and Fabricius may be mentioned. The 'Arctic Zoology' acquired considerable reputation among naturalists, and was valuable from containing descriptions and figures of many animals and birds previously unknown. It is universally consulted and referred to by authors at the present day.

When in his sixty-seventh year, he planned an extensive work on the model of the preceding, which was to embrace an account of every country in the world, with their productions; he published two volumes of this, in 1785, entitled a 'View of Hindostan.' Two more were brought out by his son, after his decease, with the name of 'Outlines of the Globe,' which also includes the description of India and the adjoining countries.

PENNATULA. [PENNATULARIA.]

PENNATULARIA, a family of Zoophyta. The Linnaean genus Pennatula included several species of compound Zoophyta, but in 1784 Lamarck divided them into seven genera, and constituted for them a grand division of the Polyphya, under the title of Polyppi natantes, or Floating Corallines. One of these genera is Enerculus, which belongs to a very different group of animals. (Animaux sans Vertèbres, tom. ii.) Cuvier, avoiding this great error, employs eight generic distinctions. (Règne Animal, 2nd ed., tom. iii., p. 317.)

Blainville (Actinologie, p. 512) places the family of Pennatularia in his class Zoophyta, and employs six genera, of which five were instituted by Lamarck and one by Cuvier.

The following are the characters of the group, according to Blainville:

Animals polypiform, provided with eight pinnated tentacula, more or less prominent, and regularly scattered on the surface of one part of the general substance. The form of the whole is determinate: the mass is composed of a central solid axis, surrounded by a fleshy substance (analogous to the bark of a tree), often very thick, and supported by calcareous acinetes more or less numerous.

All or nearly all of these animals are unattached, and float in the waters of the sea. Some writers have conjectured that in their movements the numerous polypi of the mass obey a common will. Phosphorescence belongs to several in a living state.

Whatever be the general form of the species of Pennatularia, one of the extremities is always devoid of polypi: in Pennatula this part may be compared to the tubular part of a feather, while the polypiferous portion resembles expanded bars. There is therefore in these Polyphya a bilateral symmetry which is not distinctly observed in other genera.

By this latter character, the arrangement of its pinnules, and the linearity of its rachis, Virgularia differs from Pen...
A genus of Cuvier, adopted by Blainville. Both authors agree in referring to it two species described by Bohadsch and Pallas.

There is extreme confusion of synonymy in the references to figures of Pennatulater, and particularly to Pennatula mirabilis, a term apparently given to different objects by Linnæus, Pallas, and Müller.

Pennatula mirabilis of Linnaeus is referred by Cuvier to his genus Scirpacea.

**Pennatula.**

**Animals** polyploriform, provided with eight pinnated tentaculum; rachis dilated from a cylindrical free pedicle into a broad reflexion expansion, on one face of which the polyps are scattered.

Pallas states that Pennatula reniformis (Renilla Americana), the type of the genus, has only six arms. Schwigger describes eight. There is another species (Renilla violacea), noticed by Quoy and Gaimard, from Australia.

Some of the singular fossil bodies known to geologists about the days of Linnaeus by the title of Graftonis are supposed by Nilson, Dr. Beck, and others to belong to the family of Pennatulacea.

**PENNI, GIOVANNI FRANCESCO,** called II Fattore, was born at Firenze, in 1688, and received the name of II Fattore, or the Steward, from his having been employed with the management of the domestic affairs of Raphael. He however soon became one of his principal assistants. Dr. Wasagen is of opinion that Penni executed many parts of the cartoons at Hampton Court, especially those of the Death of Ananias, St. Paul and Barnabas at Lystra, and St. Paul preaching at Athens. Of Penni's own works, no frescos and very few oil paintings remain. His characteristic tics are said to have been facility of invention, gracefulness of sentiment, and regular felicity of execution.

**Pennsylvania,** one of the United States of North America, is one of the most important in population, and industry. It extends from 38° 43' to 45° 16' N. lat., and from 74° 50' to 80° 30' W. long. It is separated on the east from New Jersey and New York by the winding course of the Delaware river, which constitutes the boundary for 230 miles. On the north it borders New York, which is separated from it by the parallel of 42°, with the exception of the most western part, where Pennsylvanians pass north of that line and reach to the shores of Lake Erie. This lake washes the boundary for about 39 miles. The western boundary runs along the meridian of 78° 17', which separates it from Ohio and Virginia for 185 miles. The parallel of 39° 43' constitutes its southern border for 260 miles, dividing it from Virginia and Maryland. Pennsylvania is divided from the state of Delaware by a curved line about 24 miles long. Its mean length from east to west is nearly 300 miles, and its mean width 156 miles. The surface is estimated to be 47,000 square miles, or about 3000 miles less than that of England.

**Surrounding Soil; Climate and Agricultural Productions.**—The Appalachian Mountains cover more than one-half of the surface of this state. Along the southern boundary-line, between Mercersburg on the east and Union on the west, the width of these mountains hardly falls short of 100 miles. Each of these ridges of which the mountain-system consists run in the general direction of the whole system, south-south-west and north-north-east. North of 40° N. lat. the eastern ridges turn to the east-north-east, and continue in that direction to the banks of the Delaware, but the western ranges continue in a north-north-west course to the northern boundary of the state. Thus it happens that between 41° and 42° N. lat. the two outer ridges of the mountains are 200 miles apart. This mountain region occupies the middle of the state, and to the south-east and north-west of it extend two hilly regions, exhibiting different natural features. The south-eastern region is estimated to occupy a surface of 7865 square miles; whilst the mountain region covers 23,189, and the north-western 13,942 square miles.

I. **The South-Eastern Region** extends along the Delaware river as far north as Williamsburg (near 41° N. lat.), and along the boundary of Maryland as far west as Mercersburg in Franklin county. Its north-western border is formed by the eastern face of the mountains called the North Mountains or Blue Mountains. The surface rises gradually from the south-east to the north-west, and near the foot of the Blue Mountains attains an elevation of between 200 and 300 feet above sea-level. It is not level and flat, but a continual ascent and descent. About 15 miles from the Blue Mountains, the hills form a continuous ridge, which rises to a considerable height near the southern boundary, but farther east exhibits frequent depressions and appears only in broken ridges. This ridge, which is called the South Mountain,
terminates on the banks of the Delaware at the mouth of the Lehigh river. The country along the Delaware has an undulating surface, rising in low and gentle swells. The soil of this tract is a sandy loam, distinguished by fertility, but well cultivated on account of the ready market afforded by the navigable river and the city of Philadelphia. About 30 or 40 miles from the river, the hills rise higher and their sides are rather steep, but the soil improves considerably, and the Clinton Valley, which is perhaps the most fertile district in the state. The country between the South Mountain and the Blue Mountains is very little inferior in fertility, especially the district which extends between the Schuylkill and Susquehanna rivers. Its surface is rather hilly but undulating.

The climate of this region resembles that of England, except that the changes are more sudden and greater, and the summers warmer, and the winters colder, than in England. The mean annual temperature seems to vary between 34° and 50° according to the elevation of the country. According to meteorological observations continued for nine years, the mean annual temperature of Germantown, near Philadelphia, is 50° 37' F., and in London 35° 2' F., and at the spring of Germantown 60° 2', and in London 54° 1'. In summer it rises in the first place to 71°, and in London to 61° 2'; in autumn it is 42° in the ridges which have the greatest cold experienced in this period, the thermometer descended in Germantown to 10° Fahr., and during the greatest heat it rose to 96°. During the winter months there is a good deal of frost and snow. When the wind has blown about during the day, the temperature is much lower, the pitch, spruce, and white pines and cedars. In many parts they attain the height of full-grown timber-trees, but in others, where the sides of the hills have been washed by heavy rains and the soil is stony and poor, they are only of low growth, and stunted. Among the valleys are chestnut, oak, and the soil is subject to inundation, sycamores. West of the Laurel Hills, the forests are mainly composed of the broad-leaved laurel, rhododendron, and magnolia acuminata, mixed with chestnut-trees and some oaks.

The table-land of Pennsylvania, on the mountain-land of 41° N lat., consists, as already observed, of large plains and some ridges. The plains have usually a gentle and somewhat undulating surface, and are partly covered with trees. Some level plains have abundant rainfall, and the highest part of the table-land is contiguous to the boundary-line of New York, and rises to an elevation of between 1200 and 1300 feet. The few ridges with which it is over-topped are few hundred feet higher. Along the watercourses the table-land is depressed, sometimes above a hundred feet, and in these districts alone, rye, oats, and some vegetables are cultivated. There are however extensive pastures on the higher parts. The climate is still more marked by the richness of the rainfall, and the low ridges cannot shelter the plains against the prevailing north-west winds. The forests of the higher land are almost entirely composed of conifers, but they do not contain many timber-trees, the stony soil being too poor for their growth. In the depressions and along the rivers are sugar-maple, black walnut, elm, and beech.

III. The North-Western Region is divided from the mountain-tract by Chestnut Ridge, whose northern projection divides the waters which run east to the Susquehanna and west to the Alleghany river. It constitutes the most external portion of the inclined plain which extends from the base of the Appalachian mountains westward to the banks of the Mississippi. Near the foot of the mountain it is from 1500 to 2000 feet above sea-level. As it approaches the boundary-line of Ohio it is still nearly 700 feet above it, in the valley of the Ohio, but much higher farther northward, where it preserves the elevation of from 900 to 1600 feet to the very boundary-line. The surface of this region is undulating, the eastern part is rather more hilly and broken, and the upper part of the eminences broad, with a rounded outline, except along the watercourses of the larger rivers, where the descent is rather steep. The soil varies very much. In many places there are large tracts with a poor and stony soil; in others, especially along the lower parts of the streams, the soil is fertile tracts. The climate does not materially differ from that of the south-eastern region, except that the winters are colder, as may be inferred from the greater elevation of the surface. The winters are rather colder, the snows deeper, and the rainfall more abundant; the summer is longer and north-west winds: the quantity of rain which falls is not quite so great. In the southern districts (south of 41° N lat.) cultivation has made considerable progress, and
The country presents a pleasing variety of fields and forests. All the grains of the south-east region are raised in abundance, and the orchards produce great quantities of fruit, especially apples and cherries. The forest consists chiefly of oak and sugar-maple. The northern districts are almost entirely covered with forests, consisting of hemlock, spruce, and Weymouth pine, intermixed with beech, birch, and sugar-maple. The Weymouth pine attains a great size in those parts.

Rivers.—The most important river of Pennsylvania is the Delaware, which is navigable for river boats to a distance of 200 miles from its mouth. [DELAWARE.] The Susquehanna rises in two branches on the table-land of Pennsylvania. One, the western branch, originates near 74° 40' W. long. and the western near 78° 40', and consequently more than 200 miles from each other. The eastern branch, which is considered the principal, has its source in Lake Otsego, near the western declivity of the Tucara mountains in New York. [NEW YORK.] It traverses the table-land of New York in a south-western and western direction, and after a course of about 140 miles it enters Pennsylvania, and soon afterwards is joined by the Tioga river, which rises on the table-land, and flows north-west, and flows about 30 miles. From the junction with the Tioga it flows about 50 miles south-east and afterwards about 70 miles south-west to its junction with the great western branch. Thus it runs about 260 miles above this confluence, which is the place of a former mouth of Susquehanna. The great western branch of the Susquehanna is, in all its extent, exclusively a river of Pennsylvania. It originates in a mountainous tract in which the Laurel Hills are connected with the Chestnut Range, south of 41° N. lat. Issuing from the table land and the south-western region. Before it reaches the upper country it is joined by the eastern and western districts. The Juniata, from the west. The Juniata rises on the western declivity of the Alleghany mountains, and runs first southward for about 20 miles; it then turns eastward, and after flowing in that direction about 10 miles more, it runs northward about 40 miles. By this circuitous course it collects by far the greatest part of the water of the Alleghany mountains in the mountain range south of 41° N. lat. It afterwards runs eastwards with the formation of the Susquehanna about 35 miles below Sunbury, after an entire course of more than 150 miles. After leaving the mountain region above Harrisburg, the Susquehanna still flows through a country formed by the Alleghany mountains, but below Harrisburg, and before it enters this valley it is joined from the north-east by the Swatara creek, whose course hardly exceeds 50 miles. The course of the Susquehanna through the south-eastern region may be about 120 miles; so that the river flows 200 miles after the junction of its branches near Sunbury. The Susquehanna is not navigable, owing to the rapidity of its current and the numerous rocky ledges which form numerous rapids. The last rapids occurs about 20 miles from its mouth in Chesapeake Bay, and so far small vessels may as easily run up the river. The water of this river however has lately been used in the construction of canals. Some of the affluents of the Susquehanna, as the Tioga, Juniata, and Swatara, are navigable for small boats, at least a considerable part of the year, when the rivers are full.

The western part of the state is drained by the two principal branches of the Ohio, the Alleghany and Monongahela rivers. The Alleghany rises within this state on the table-land, near 78° 40' W. long. and 41° 40' N. lat., and after a circuitous course of about 30 miles it enters New York, where it becomes navigable for small boats at the town of Olean. About 20 miles lower it re-enters Pennsylvania and runs about 150 miles more, principally by a southern course and with numerous rapids. It meets the Alleghany hills, to its junction with the Monongahela at Pittsburgh. Though rather a rapid river, running at the rate of about two miles an hour, it is navigable for boats during several months of the year. The other branch of the Ohio, the Monongahela, rises in Virginia, near 35° 30' N. lat., about 250 miles from the source of the Alleghany. Its upper course is between the great Alleghany mountains, and impedes by rapids. It sets in and forms some miles south of the southern boundary of Pennsylvania, where the river breaks through the Chestnut Ridge, from this place it is navigable for boats to its junction with the Alleghany river. This course is about 160 miles, which is in Pennsylvania and Ohio. As to the Ohio, see MISSOURI, vol. xv, p. 284.

Productions.—The principal agricultural produce of Pennsylvania are already noticed. The forests of Pennsylvania are of extraordinary size and strength. Their average height is about 5 feet 4 inches, but the larger sometimes attain a greater height. Cattle are numerous, especially in the north-west region, and generally of a good breed. Sheep are kept in most parts, but the wool is not fine. The wild animals have much diminished. The elk has entirely disappeared, and the deer begins to be scarce. In the northern and less cultivated districts are still found the brown bear, the wolf, wild cat, fox, racoon, and marten. Among the birds, the wild turkey is the largest. Several kinds of fish are plentiful in the rivers, as salmon, trout, carp, shad, &c.

Pennsylvania is rich in minerals. The most important is coal, anthracite and bituminous. The anthracite coal is found near the eastern extremity of the ridges of the Appalachian mountains, from 50 to 80 miles from the banks of the Delaware river, where it exists in three large fields or deposits. The most southern is on the Susquehanna, and according to a rough estimate, it occupies an extent of country 65 miles in length and 5 miles wide, or an area of 325 square miles. It is worked in several places, near Fort Carbon on the Shy-kill, and near Mauch Chunk on the Lehigh. It is estimated that 500,000 tons of coal extracted from this field in 1823 amounted to 429,933 tons. The second field lies farther north on both sides of the Lackawannock, a branch of the eastern Susquehanna, and is said to occupy a similar extent of country. It is worked at some places, and in 1833 not less than 161,777 tons of coal were taken from it. The third coal-field lies farther inland on both sides of the Susquehanna, above its confluence with the Juniata. It is not yet worked. It is supposed that these three coal-fields occupy an area of 975 square miles, and produce about 800,000 tons of coal annually. The others are little worked, as the surrounding country abounds in forests; but in the manufactures of Pittsburg, and in those of salt, about 250,000 tons are annually consumed.

Salt-works are common all over the region of the bitu- minous coal in Pennsylvania. The oldest is the Schuylkill river, which was commenced in 1816. It begins at the Fair Mount waterworks, near Philadelphia, and extends along the Schuykill river to Reading, and thence to Mount Carbon, where the
mines are worked. Its length is 108 miles, of which 45 lie in the bed of the river, and the rest in canals. In 1833 not less than 361,054 tons of goods descended this canal, of which 322,971 were coal, and 55,219 lime and limestone. In the summer of 1834, in 1830, extended from the Easton on the Delaware, up the Lehigh river, to the coal-mines of Mauch Chunk, a distance of 46 miles. It is of larger dimensions than the other canals, admitting boats of 50 to 60,000 tons of coal, were brought down, but at present probably more than twice that quantity. The Lackawaxen Canal begins at the confluence of that river with the Delaware, and extends to Honesdale. From Carbonale, a distance of 16 miles, to the coal-mines in the county of Luzerne. More than 150,000 tons of coal were brought down this canal in 1833.

The canals, designed in general for the transport of goods, began to be the chief is the Delaware and Erie Canal, which connects the Delaware river with Lake Erie. This great line of communication begins at Philadelphia with a railroad, which traverses the south-eastern region, and terminates at Columbus the Susquehanna. At about this canal begins, which extends along the river upwards to the mouth of the Juniata. It thence follows the course of the last-mentioned river to Huntingdon, where it leaves the main body of the Juniata, and runs along one of its affluents, called the northern branch of the Juniata, to the Allegheny mountains, where it terminates at Hollidaysburg. The Allegheny mountains, which rise more than 1,500 feet above their base at Hollidaysburg, are traversed by a railroad. Glass are the principal manufactures at Johnstown. Here the second line of canals begins, which first runs along the banks of the river Conemaugh to its confluence with the Allegheny, and then along the last-mentioned river to Pittsburg, where it ends; the Ohio, between Pittsburg and the mouth of the Big Beaver, a distance of 26 miles, constituting the link which connects the second line of canal-navigation with the third line. The Big Beaver offers an easy navigation for canal-boats as far up as Newcastle, 24 miles, where the third line begins. This line extends to the Point, and to the western waters of Pennsylvania. The Allegheny another canal proceeds along the western Susquehanna to the centre of Lycoming county; it is 26 miles long. A canal has been made to connect the Schuylkill canal with the great line, which is called the Union Canal. It begins near Reading on the Schuylkill, and runs along the bed of two small rivers, the Tulpehocken, an affluent of the Schuylkill, and the Swatara, a tributary of the Susquehanna, terminating on the last-mentioned canal at Mechanicsburg.

As the Delaware river above Trenton presents obstructions to navigation for several months of the year, a canal has been made along its course. It begins at Bristol on the Delaware, and terminates at the mouth of the Lehigh. This canal is about 90 miles long. The upper branches of the Lehigh river, called the French Creek, has much water, but is not navigable for boats, on account of several rapids. A canal has accordingly been made along its course, which extends from its confluence with the Allegheny to Franklin, a distance of 14 miles.

All the canals of this state are near 900 miles in length, of which about 600 miles are at the expense of the state; and the railways which are connected with them are 118 miles. The expense by which the canals, and the Union Canal, have been made at the expense of incorporate companies of private persons, and have cost more than six millions of dollars.

Inhabitants.—According to the census of 1830, the population of Pennsylvania consisted of 1,049,458 individuals, which, when added to the 1,248,922, which was an increase of more than 28 per cent. In the last-mentioned year there were nearly 30 persons to a square mile. There were then 40,315 persons of colour among the inhabitants. The population is very unequally distributed. The south-western region, which is the most fertile of the state, contains nearly one half of the population, and the north-western region, which is little more than half as large as the mountain region, equals the latter in population. In the mountain region the population on the square mile hardly exceeds 2 individuals, while there are nearly a hundred to a square mile of the south-eastern region.

In no part of the United States is the number of German settlers and their descendents so large as in Pennsylvania. There are districts in which the German is the predominating language. It is supposed that the Germans form one-fourth of the population. They have their own schools and institutions of education, in which the instruction is given in the German language. A great number of German newspapers are printed in Pennsylvania. Some of the German families are of the old school, and the manufactures occupy the first place. They are chiefly in the north-western region, at Pittsburg, Brownsville on the Monongahela, and some other places. One of the principal objects is the manufacture of steam-engines for the naviga-

Manufactures.—Pennsylvania is one of the most manufactur-

Commerce.—The produce of the agriculture and manu-

Manufacturing industries of Pennsylvania is carried to the other states of the Union or to foreign countries by three different routes. The south-eastern region sends its products by the way of Philadelphia, which is the only seaport in the state. [PHILADELPHIA.] Though at present a complete line of canals has been made to connect the canals and railways of Ohio with those of Union.
Canal. This new route cannot fail to increase in a very
considerable degree the manufacturing industry of that part
of Pennsylvania.

Political Divisions and Towns.—Pennsylvania is divided
into fifty-one counties. The seat of government is at Har-
risonburg, on the Susquehanna, not far from the place where
the Union canal joins the Susquehanna as well as Lebanon.
In 1839 it contained 4307 inhabitants, but it can only rise
to importance when the northern district is well inhabited and
cultivated. The largest town of the state is Philadelphia.

[PHILADELPHIA—South-west of it, on the banks of the Dela-
ware river, and opposite to the town of New York, is a
place called Philadelphia, a thriving place, with more than
3000 inhabitants. Reading, on the banks of the Schuylkill
river, near the place where the Union canal joins the Schuylkill
canal, is a thriving place, with 1500 inhabitants, and a good
exchange. Easton, likewise on the Delaware, at the mouth
of the Lehigh river and the commencement of the Lehigh
canal, is a thriving place, with more than 3000 inhabitants.
Reading, on the banks of the Schuylkill, near the place
where the Union canal joins the Schuylkill canal, is a very
thriving place, which in 1830 had 5831 inhabitants, and
has manufactures. Lebanon, on the Union canal, has above
2000 inhabitants. Lancaster, the largest place in the south-
eastern part of Pennsylvania, before the town of Philadelphia,
and 1830, 7684 inhabitants, mostly employed in the manufactur-
ing of cotton and wool, iron, leather, hats, ropes, and tobacco.
North of it is Ephrata, or Dunkertown, the principal settlement
of the German Anabaptists, who have established several
manufactures of cloth, and have a large community, in Carlisle, not far from the foot of the Blue Mountains, in the
fertile valley of Cumberland, and has 3000 inhabitants, and
a college called Dickinson College. York has 3000 inhabi-
tants, and some manufactures on a small scale, with an
annual income of 3000 dollars. Gettysburg, a small place, has
a college for Lutheran clergymen; in its vicinity some siloise-
ware was found in 1826.

None of the towns in the mountain region have risen into
importance. Sunbury and Northumberland, as well as Wilkes
Barre, are of no consequence, with the exception of the Susque-
anniana canal; and Lewistown and Huntingdon on the Dela-
ware and Erie canal. Bedford, on the Juniata, which begins
to be navigable at this place, has some commerce, and manufac-
tures. The most important place in the north-west region is
Pittsburgh, which stands on the peninsula formed by the
confluence of the Alleghany and Monongahela rivers, where
the navigation of the Ohio in larger boats begins, and on the
southern end of the French post Fort Duquesne. It is the
principal point through which the traffic between the coun-
tries west of the Appalachian Mountains and those along the
Atlantic is carried on by land. Besides the line of com-
munication established by canals and railroads, an excellent
transportation is carried through Maryland and Baltimore.

Washington. The navigation on the Ohio, Big Beaver
river, and the canal to Clevelend in Ohio, increases the
great advantages possessed by this place, among which the
most important are the immense beds of coal which sur-
round the town and the possibility of manufacturing.

In 1820 it was 7248; in 1830, 12565, exclusive of the
suburbs, and with them, 23433; and probably it is at
present near 50,000. In the beginning of 1830 there were
sixteen foundries and engine factories on a large scale, be-
side some of less magnitude; nine rolling-mills, cutting
two tons of nails and rolling eight tons of iron per day; six
cotton factories, having 20,000 spindles and 116 power-looms;
six extensive white-lead factories; six steam saw-mills; four
steam grist-mills; five large breweries; ten extensive glass-
works; and upwards of 100 steam-engines in full operation.
In addition to these there are numerous other manufactures in
iron, wood, and leather, on a small scale. Brownsville, on the
Monongahela, which becomes navigable some miles higher up, is a
station of some importance, with 1200 inhabitants, Etna, a
small place with 1500 inhabitants, on the shores of Lake Erie, is a port of entry, but has little commerce, the
surrounding country being very thinly inhabited.

Government and Religion.—The state has nine counties, five
of which are in the western part of Pennsylvania, and four in the
western. The University of Pennsylvania, in Philadelphia,
has an academic faculty of five professors, and a medical
faculty of nine professors; it is the largest and best medical
school in the United States. Dickinson College, at Carlisle, has
four instructors, and a library of 7000 volumes. La Fayette
College, at Easton, has a president and three professors. Penn-
sylvania College, at Gettysburg, has a president and four
professors. Bristol College has a president and five
instructors. The Western University, in the northern suburbs
of Pittsburgh, has four instructors. Jefferson College, at
Pennsylvania, has a president and six professors, with a
library of 3500 volumes. The Jefferson Medical School,
which is in Philadelphia, is a branch of this institution, and
has six professors. Washington College, at Washington,
has seven instructors, and a library of 1500 volumes. Adap-
ting to the character of Pennsylvania and the wealth of
the state, a common school fund, which was to accumulate
$100,000 dollars a year. Bethlehem, a Mission settlement on the Lehigh, is the seat of a very successful
seminary for females. As to the manual education of
students, Girard has a college for the education of Navy.

The principal sects in the state are Presbyterians, Meth-
odists, Baptists, German Reformed, and Episcopalians. The
Quakers are also numerous in the eastern part of the state,
and the Roman Catholics in every part. A large part of
the population of Pennsylvania consists of the western
western districts, are Germans; they retain the use of their
language, and a considerable number of newspapers at
German are printed and circulated in the state.

Historical Events.—Colonists from the colonies on the
shores of Chesapeake Bay were made by the Swedes in 1632.
Though engaged in a long war with the Poles, Gravitus
Adolphus sent a small colony to this part of America, which
settled on Chesapeake Bay. But his attention was soon
engaged by the interests of the state of New York, which
was at war with Denmark, and the Dutch had declared
against him, they took possession of the Swedish colony in
1638, and kept it, but were obliged to cede it to the Eng-
lia in 1664. Several dispersed settlements had been
made on the Ohio, but a line of forts was not established until
1764. The territory was granted by Charles II. in 1681 to William Penn, who con-
sidered it just to buy from the original possessors, the Indians,
what had been granted by the king of England. In 1682
the town of Philadelphia was founded, and framed a constitution, which was settled by an assembly of the citizens in
December, 1682. The humane principles on which the
constitution and laws of Pennsylvania were based, attracted nu-
merous colonists to this country from most parts of Europe,
especially from Germany. They all settled hovels in the
present county, whilst the remaining part of the territory
was cut up into the possession of the north-west region. The French,
advancing from Canada, got possession of this back country,
and built Fort Duquesne in 1752. This fortress was soon
surrendered to the British forces. In 1757 the colonists who inhabited the country near the mountain
suffered much from the incursions of the Indians, who had
taken part in the war. In 1774 the delegates of the colonies assembled in Philadelphia, declared against the
right of taxation by the British Parliament, which may be considered as the declaration of war,
and in 1776 the representatives of the thirteen states de-
clared their independence. The seat of the federal govern-
ment was at Philadelphia till 1800, when it was removed to
Washington. The constitution of Pennsylvania was amended sev-
eral times, and remodelled in 1777, after the declaration of
independence. The last alteration was in 1824. According
to this constitution, the legislature consists of two bodies, a
House of Representatives and a Senate. The number of
representatives of each for each House is 200. There are
all persons who are twenty-one years of age, who have
resided two years within the state, and have paid taxes.
The number of senators is thirty-three. They are chosen for
four years, in districts of the several counties, and are
enuated to elect the representatives: one-fourth from annual,
united and equal counties. The executive power is vested in the governor, who succeeds by the citizens for three years, and may, if re-elected, hold
his office nine years out of twelve. Pennsylvania sends two votes in the electoral college, and its members to the House of Representatives at Washington.

(Continued from the previous page.)

PENNY (COIN)

PENNYROYAL (MINTIA PILEGUM)
PENOBSCOT. [MAINE.]
PENKITH. [CUMBERLAND.]

PENRYN, a corporate town in the parish of Gluvias, in the west division of the hundred of Kerrier, in the county of Cornwall, 273 miles from the Post-office, London, by the Falmouth and Exeter mail route, which is by the south-western railway to Beaminster, and thence, by road, through Andover, Salisbury, Exeter, Launceston, and Lisburne, to London, a distance of 79 miles. It was incorporated by an Act of the 15th of June, 1298, and was incorporated by James I. It was garrisoned by Charles I. in the great civil war, and surrendered to Fairfax, March, 1646.
The town is about two miles from Falmouth, at the end of one of the finest mineral kind of country, which abounds in op- plums, and small towns and villages on the borders of the sea. The Falmouth Harbour has a commodious space for wharves, and there is a considerable trade carried on between Penryn and the populous mining district of Redruth. There is an episcopal chapel, and several dissenting places of wor- ship. The area of the municipal borough comprises 290 statute acres. In 1831 it contained 598 inhabited houses, and in 1833, 726 (Municipal Corporation Boundaries Report); the number is increasing, and the importance of the town for the convenience of the district. There are col- lins, corn-mills, breweries, and numerous shops. There is a weekly market, and there are five fairs in the year. The borough returned two members to parliament from the town in 1614. The linen and corn from the Falmouth was, for parliamentary purposes, united with it. The number of votes in the year 1835 was, for the united borough, 832. The council, by the Municipal Reform Act, consists of 4 aldermen and 12 councillors, but the borough and rural fairs are the principal in the vicinity of Gluvias. The town is about two miles from the town, one national school, with 130 boys; nine other day-schools, with 217 children of both sexes; two boarding-schools, with 77 children; and three Sunday-schools, with 365 children of both sexes. In the year 1834 the number of voters was not included in the returns, but in the year 1835 the number of borough was three day-schools; one, a national school, with 137 boys, and two others with 42 children; and one Sunday-school, with 150 children. The census of 1839 shows a great increase of Russia in Asia, which, after having formed a province of the Khante, or great government of Kasan, was erected into a separate government in 1780. In 1796 it was united with the govern- ment of Saratoff, from which it was again separated in 1804 by the Emperor Alexander. It is bounded on the north by Nischnev-Novgorod, on the east by Simbirsk, on the south by Saratoff, and on the south-west and west by Tamboff. It lies between 53° and 54° N. lat., and between 42° 20' and 43° 20' E. long. The surface is slightly undu- lating, and the country is rich in agricultural land. It is watered by numerous rivers, but most of them are small and not navigable. The most important rivers are the Soura and the Mochka. The Soura, which rises in Saratoff, enters Penna to the south of the chief town, traverses the eastern part of the district, and enters the Sea of Azov. The Mochka rises in the government itself, waters the north-east part of it, and, after running northwards to the west, and enters the government of Tamboff. The government contains six small lakes, which are temperate and very agreeable in summer, but the winter is cold; and the sky is clear and the air very healthy.
The soil is extremely fertile, and produces, without ma- nure, fine crops of wheat, rye, barley, and oats, which not only supply the demands of the government, but a considerable surplus for exportation. Hemp and flax flourish, and the gardens produce all kinds of vegetables. Tobacco and hops are not grown, and potatoes only here and there. The inhabitants grow apples, pears, and cherries, but pay little attention to them. Wild ber- ries of various kinds are extremely plentiful. The forests are of vast extent, but, as they have been observed in other provinces of Russia, the most extravagant waste has been com- mitted on them. Pines are rare in the forests, which consist chiefly of the oak, the beech, the birch, and the elder. There are still wild deer and a great quantity of game, but the fur-bearing animals have disappeared. The chief occupations of the inhabitants are grazing and agriculture, and the Mordwins in particular have great quantities of bees. The fisheries are of little importance. The government is rich in timber, lime, and stone, in peat, coal, and millstones. The population and extent of this government have been variously stated. Dr. Schubert (1833) gives it an extent of 16,100 square miles, and only 470,000 inhabitants, in which he has probably, by an over- sight, taken the number of males, who alone are counted in most of the governments. But M. Koppen, member of the academy of sciences, who is employed under the minister of the empire, has just published a very remarkable memoir on the population of the Russian empire in 1838, which is not only the latest but probably the most correct that has yet appeared. He states the population of Penna at 465,021 males and 502,779 females (total 987,799); and the territorial ex- tent at 13,167 square miles, divided into ten circles. The great majority of the inhabitants are Russians of the Greek church, with whom, however, there are also many sects, the Mordwins (about 15,000 males), mostly converted to Christianity; and the Kazan Tartars (9000 males), who are still Mohammedans. The very few followers of Schamanism among the Mordwins are very few. There are several manufactories, properly so called, on a large scale. A few years ago there were twelve of cloth, seven of soap, three of glass, six of beet-root sugar, besides thirty- four tan-yards, &c. But the country-people manufacture cloth, and wool, and all kinds of utensils and for their own use. There is a manufactury of blankets and carpets at the village of Jola. The distilling of brandy is carried on to a very great extent. The trade is chiefly carried on by land, especially with Nischnei-Novgorod. In the government of Penna, Nischnei, Nizhni, Saransk. The exports are corn, flour, brandy, soap, wax, honey, potashes, wool, sail-cloth, carpets, blankets, wooden ware, &c.

With respect to public instruction, Penna is under the university of Kasan, but the schools are few in number. The only printing-office belongs to the crown. There are in the government 619 churches, of which 11 are cathedrals, five monks' convents, and one nunnery. The Tartar mosques are to the number of 96, of which 43 are for the use of the Tartars. In Penna, the capital of the government, is built on an eminence at the confluence of the Soura and the Soura, in 55° 12' N. lat. and 45° 50' E. long., 465 miles from Moscow. It was founded in 1666, and is a flourishing town, with 30,000 inhabitants. In the government of Penna, there is a brisk trade. Penna is a bishop's see, and has a gymnasium, a seminary, two convents, to each of which two churches are attached; seven other churches, and a cathed- ral. The houses are all of wood, and the population contains 11,000. The capitals of the other nine districts, though not very interesting, are pretty considerable: the principal are Nischnei-Lomoff (7000 inhabitants), where a great annual fair is held from the 1st to the 16th of July; the chief articles sold are leather, furs, wax, drugs, and colonial pro- ducts. A town of 12,000 inhabitants, Kama, is of great importance. there is near 9000 inhabitants, nine churches, two cathedrals, and a convent of monks. It is a very thriving little town. (Schumill, La Russie et la Pologne; Hirschelmann, Handbuch; Erman, Reise nach Siberien; Russian Official Journals.)
PENSACOLA. [FLORIDA.]
PENSION, an annual sum granted by the state to an individual. The word pension signifies a present from the state by the state according to the nature of the govern- ment. In a monopoly the services rendered to the sovereign by those who surround his person will recommend them as fitting objects of reward; where a mixed form of government prevails, but there is some standard of reward independent of personal bias or caprice. In this country the distribution of pensions is now almost entirely subject to the control of the legis-
tute; but the following notice will show that persevering and long-continued efforts have been necessary to place it under its ancient freedom.

Before the reign of Queen Anne, the kings of England alienated or encumbered their hereditary possessions at pleasure, and the courts of law sustained them in the exercise of this power. In 1690-91, Chief-Justice Treby, in answer to the objection that such power might lead to the destruction of the revenue, said, 'This might be some reason to induce the making of an act of parliament to restrain the king’s power of alienation; but since here the parliament has thought fit to give the king a key to such a power, we ought, I think, to submit to it.' (State Trials, xiv., p. 30.) By the 1 Anne, c. 7, the right of burdening the revenue of the crown with improvident grants, to the injury of the successors of the throne, was materially abridged. This statute, after reciting that 'the necessary expenses of supporting the crown, or the greatest part of them, were formerly defrayed by a land revenue, which hath from time to time been impaired and diminished by the grants of former kings and queens of this realm, enacts that no grant of manciple, for sixpence, shall be made by the crown from and after the 25th of March, 1702, beyond the term of thirty-one years or for three lives, reserving a reasonable rent. As this clause applied only to the land revenue, it was enacted by another clause that no portion of other public revenue of the crown, money授予 or other provision, should be alienable by the crown beyond the life of the reigning king. On the accession of George III., in consideration of the surrender of the larger branches of the hereditary civil list and the private revenue estimated on his reign, the revenue was reduced to 900,000l. and afterwards increased to 900,000l. per annum, on which the pensions were charged. There were no limits, except the Civil List itself, within which the grant of pensions was confined; and at various times, when debts in this list had accumulated, parliament voted considerable sums (Sir Henry Parnell, in his work on 'Financial Reform,' says 'some millions') for their discharge. In February, 1790, during the administration of Lord North, Mr. Burke introduced his bill for the better security of the indigent clergy, and for the more permanent support of the civil and other establishments. In this bill it was recited that the pension lists were excessive, and that a custom prevailed of granting pensions on a private list during his majesty’s pleasure, under colour that in some cases they could not be expedient to divulge the names of persons on the said lists, by means of which much secret and dangerous corruption may be hereafter practised. Mr. Burke proposed to reduce the English pension list to a scale fixed by the house, not exceeding 95,000l. This act (22 Geo. III., c. 1) asserted the principle that distress or desert ought to be considered as regulating the future grants of such pensions, and that parliament had full right to be informed in respect to this and other matters, in order to fix the responsibility of the ministers of the crown. Mr. Burke’s speech on introducing his bill will be found in the third volume of his 'Works,' ed. 1815.

Up to this time the Civil List pensions of Ireland, the pensions charged on the hereditary revenues of Scotland, and the pensions charged on the 4 per cent. duties, had not been regulated by parliament.

In Ireland the hereditary revenue of the crown was used as a means of extensive political corruption, the English act of 1701 was not adopted, and the 4 per cent. duties were not withdrawn from the private control of the crown until 1830, when they were surrendered by William IV. for his life, the pensions then chargeable upon them continuing payable. On the accession of the late king (Wm. IV.) the question of the reduction of Civil List, both of Ireland, England, Ireland, and Scotland being consolidated; and this was effected by 1 Wm. IV., c. 25, which also made provision for their reduction, on the expiration of existing interests, from an amount of 145,750l. net, to a future maximum sum of 75,000l. The Civil List for England was at the period 74,200l. net; Scotland, 23,450l.; Ireland, 47,900l.

In 1830 the monarchy of the Duke of Wellington was overthrown on the question of referring the Civil List (which comprises the Pension List) to a select committee, Sir Henry Parry in the House of Commons moved resolutions, the following effect, which were agreed to:

That it is the bounden duty of the responsible advisers of the crown to recommend to his Majesty for grants of pensions on the Civil List such persons only as have just and meritorious claims to them, to confine the grants of these services to the crown, by the performance of duties to the public, or by their useful discoveries in science and attainments in literature and the arts, have merited the gracious consideration of their sovereign and the gratitude of their country.' On the accession of the Victoria, in 1837, the subject of pensions was again considered; and a select committee of the House of Commons, appointed to inquire into the Civil List, recommended,—That in place of granting a sum of 75,000l. for Civil List pensions, her Majesty should be en-
powers to grant in every year new pensions on the Civil List to the amount of 2,000l., these pensions to be granted in strict conformity with the resolutions of the House of Commons, of February 15, 1834. These views were adopted by the House, and embodied in the Vic., c. 5, the resolution being introduced into the Act. Since the accession of Queen Victoria, still greater force has been given to the spirit of the Act, in consequence of the recommendations of a select committee of the House of Commons, appointed in December, 1837, to inquire into how far the pensions charged on the Civil List, as settled on the accession of William IV., ought to be continued, having due regard to the just claims of the parties and to economy in the public expenditure. This committee, after receiving views of officials of the civil service, in each case on the Pension List, recommended the immediate suspension of several pensions, to be regranted on the responsibility of the government, should the circumstances of the parties render it necessary; others they considered should determine at an earlier period than specified in the original grant; and for several pensions, they considered it unadvisable to make any future provision. In their Report, dated July, 1838, the committee recommended that in the case of all future Civil List pensions, the reasons and motives of the grant be set forth in the warrant of appointment; that in grants for services to others than the individual by whom the services were rendered, care should be taken, if these grants are for younger lives, that is, to the sons or daughters of the individual entitled, that the increase of pensions be made; and that such grants should be avoided, except under very peculiar circumstances: they recommended also that pensions for the relief of distress should be granted only on the condition of their being paid when the circumstances of the parties no longer required them, and that continuances should be held liable to deduction or suspension in the event of the parties being appointed to office in the public service; that under no circumstances should the mere continuance of pension with the hereditary rank of their origin be considered as a justification of a grant of pension. The committee also recommended that, in order to avoid any possible doubt or misconception hereafter, enactments should be made with respect to the Irish and Scotch revenue analogous to those contained in the English statute of 1 Anne.

It appears from a table in the Report of the Select Committee on Pensions (No. 621, sess. 1838) that the charge of pensions has been reduced as follows:

<table>
<thead>
<tr>
<th>England</th>
<th>Ireland</th>
<th>Scotland</th>
<th>40 per Cent.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1782</td>
<td>85,000</td>
<td>80,000</td>
<td>13,300</td>
<td>16,700</td>
</tr>
<tr>
<td>1820</td>
<td>74,200</td>
<td>67,300</td>
<td>37,100</td>
<td>43,300</td>
</tr>
<tr>
<td>1830</td>
<td>74,200</td>
<td>67,300</td>
<td>37,100</td>
<td>43,300</td>
</tr>
<tr>
<td>1838</td>
<td>The lists consolidated.</td>
<td>140,900</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mr. Finlayson, of the National Debt Office, calculated, in 1838, the amount of saving which will be derived from the new system, assuming the ratio of decrease to continue as in the three previous years, and that the average ages of the new grants of pensions are made will be the same as heretofore:

<table>
<thead>
<tr>
<th>Old Pension</th>
<th>New Pension</th>
</tr>
</thead>
<tbody>
<tr>
<td>1839</td>
<td>132,632</td>
</tr>
<tr>
<td>1844</td>
<td>97,540</td>
</tr>
<tr>
<td>1849</td>
<td>95,238</td>
</tr>
<tr>
<td>1854</td>
<td>30,792</td>
</tr>
<tr>
<td>1858</td>
<td>13,161</td>
</tr>
</tbody>
</table>

Mr. Finlayson was furnished by the committee with the ages of 866 persons in the receipt of pensions; and in 928 of these cases the date of the grant was ascertained. The mean age at which pensions were granted to males was found to be 32, and to females 36; and out of every 1,000f. payable, 237f. was paid to males and 743f. to females. Mr. Finlayson complains that 'the females have understated their ages very considerably, and sometimes made a complete tampering with the entire age of a whole life having set down their age at 39, forgetting that she has been fifty-four years in receipt of the pension, and this from an averment to own the age of 40. The following is an account of the total amount of pensions granted in each year, ending the 20th day of June, from 1829 to 1839 inclusive:

<table>
<thead>
<tr>
<th>Years</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1829</td>
<td>18,030</td>
</tr>
<tr>
<td>1830</td>
<td>6,533</td>
</tr>
<tr>
<td>1831</td>
<td>5,401</td>
</tr>
<tr>
<td>1832</td>
<td>2,638</td>
</tr>
<tr>
<td>1833</td>
<td>940</td>
</tr>
<tr>
<td>1834</td>
<td>2,678</td>
</tr>
</tbody>
</table>

Besides the pensions on the Civil List, the regulation of which at different periods has been referred to above, there are various sums annually appropriated to the payment of pensions of another description. Thus in 1836-7 the sum of 1,350,000l. was voted on account of the pensioners of Chelsea Hospital, 79,500 in number; 245,000l. to the out-pensioners of Greenwich; 148,980l. to 3082 officers and men of the navy; 20,000l. to officers of the army; and to officers of the civil departments of the government large sums are annually paid in pensions and superannuation allowances.

The half-pay to retired officers of the navy and army may also be considered in this light of a pension. In 1832 the charge on the public for pensions, superannuation, and half-pay amounted to 6,152,702l. (Financial Reform, p. 203, 4th edit.) The operation of the superannuation, the grant of retired allowances, the naval and military pensions granted for good conduct, the pension granted to the Queen in 1757, George III., c. 65, for persons who have occupied high political offices, and the pensions for diplomatic and consular services, have to a great extent superseded one of the original purposes of the Pension List. These acts have also substituted a strictly defined and regular system of retirement for a system which depended on the arbitrary selection of the crown or the recommendation of the existing government, exposed to the bias of party or personal considerations. (Report on Pensions, No. 218, sess. 1838.) Sir Henry Parry, in chapter 2 of his Encyclopédie Méthodique (section 'Finances'), has noted that there are many abuses to be remedied in reference especially to superannuations. 'Nothing (he says) can be more extravagant and inconsistent with a proper guardianship of the public purse than the payment of salaries and superannuations now in operation. The salaries are so much higher than they ought to be, that every officer and clerk has sufficient means of making a provision for infirmity and old age. But notwithstanding this fact, as to the sufficiency of salary, in the true spirit of profit, a grant of superannuation allowance has been added.' In 1830 there were nearly one thousand officers in the public service, with salaries of 1,000l. a year and upwards, enjoying amongst them 2,056,574l.; and of these there were 216 persons whose salaries averaged 429l.; and yet from the time of the Supperannuation Act in 1810 till 1830, the charge for civil superannuation was increased from 94,550l. to 480,081l. It was stated in the Third Report of the Finance Committee (sess. 1828), that in not a few cases persons obtained superannuations, as units for their public service, who were in health and strength long afterwards, and discharged the active duties of life in private business. In 1831 the treasury established some very important restrictions relative to superannuation, which are given in a Parliamentary Paper (No. 190, 2nd session, 1838).

For an account of pensions under the French monarchy the reader may refer to the Encyclopédie Méthodique (section 'Finances').

PENSIONARY, GRAND, was the name generally given to the first magistrate of the state or republic of Holland, which was a member of the confederation of the Seven United Provinces of the Netherlands. The Pensionary was the president of the council of the states or legislature of Holland, and he was at the time the first minister of the republic, transacted business with foreign powers, and like the Avoyer of Bern and other Swiss cantons. He was elected for five years, but was generally confirmed indefinitely, and often for life. He was also in virtue of his office the perpetual depository of the state of the stamp duties of the states-general of the United Provinces, of which he was a most influential member, in consequence of the superior importance of the province of Holland. His name was derived from the pension which was attached to his office. He was also styled ad interim general to the state of Holland. The individual chosen for this high office was a person well versed in the science of the law, and he is styled by Grotius 'Adssesor Jurisprudentiae.' The various towns of Holland and Zealand had also each their pensionary, or chief municipal magistrate. (Barneveldt, Johan van Olden.)

PENTACHORD, an ancient Greek musical instrument, Vol. XVII.-3 1
which had, as the word implies, five strings. The term also signifies a scale of five sounds.

PENTACRinus [Encrineda]

TACITUS. THE TACITAN TREE. This is a tree found in Sierra Leone, from which a fatty substance is obtained, which has given rice to its name of the Butter and Tallow Tree. It has an ovate fleshy fruit, about as large as an orange, and its stamens are collected into five parcels, which is its better-known feature. More is known of it than that it belongs to the natural order Guttifer and Clusiaceae.

PENTAL'SMIS. [Chiripada, vol. viii, p. 207.]

PENTALEPAS. [Pentalaemis].

PENTATEUCH (Hebraic, from πέντε, 'five,' and ταχήν, a Greek name of the first five books of the Old Testament, which are called in Hebrew יָעַסָּה, the law. The Hebrew copies of the Pentateuch form one volume; the division of it into five books is first mentioned by Josephus, and seems to have been made either by the Septuagint translators, or before their time, and after the return of the Jews from Babylon.

The first, second, fourth, and fifth books of the Pentateuch have been treated of under Genesis, Exodus, Numbers, and Deuteronomy.

The third book is called Leviticus (Avimrosos), from its treating chiefly of matters pertaining to the priests, the sacrifices being its chief subject. It was given the name of Leviticus, as its latter part only was divided into four parts, as follows:—I. The laws concerning sacrifices, including the burnt offerings (chap. i.), the meat-offerings (chap. ii.), the peace offering (chap. iii.), the offering for sins of ignorance (chap. iv.), and the trespass offering for sins done knowingly (chap. v.). II. The institution of the priesthood, including an account of the consecration of Aaron and his sons, and of the punishment of Nadab and Abihu (chaps. vii-x). III. The laws concerning clean and unclean animals, purifications, and expiatory sacrifices, including also sundry other enactments (chaps. xii-xvii). IV. The laws concerning sacred festivals, vows, things devoted, and tithe (chaps. xxii-xxvii). Though the ordinances of this book were manifestly intended solely for the Jews, as is evident from their own nature, yet it contains matter of the highest importance to Christians, inasmuch as the New Testament teaches that the rites of the Jewish sacred law were all or nearly all typical of the truths of Christianity; this is especially shown by St. Paul in his Epistle to the Hebrews, an episope whose very substance is almost unaltered without the slightest change upon it by the book of Leviticus.

With regard to the Pentateuch in general, it has never been doubted, till at a recent period, that Moses was its author. The following are the chief arguments for its genuineness:—I. It is entirely interspersed in the book itself, that Moses was the author, and that he wrote it at the command of God. This assertion is made with regard to the whole book (Deut. i. 5; xxxi. 9-13; 22, 24-26), and to separate parts of it (Exod. xvii. 14; xxxiv. 4, 7; xxvii. 26; Num. x. 1-4). In the supposition that which Moses makes in the book of Deuteronomy, he frequently speaks of 'the law,' 'this law,' 'the book of the law,' 'the book of religion,' by which expressions we cannot fairly understand anything except either the written book, or that part of the written book which he composed as a whole (Deut. i. 5; iv. 44-49; Exod. xi. 13-29; Num. xi. 1-13; xix. 6-9; xxxii. 41; Deut. iii. 14; Num. xiii. 3). To these arguments is to be added, that in this class of writings it contains an account of the death and burial of Moses, which was not written by himself. In some parts however of his narratives, Moses appears to have made use of previously existing documents, especially at the beginning of the book of Genesis. (Conclus.)
The Samaritan Pentateuch is quite entitled to rank with the Hebrew as an independent source for settling the sacred text. In some places it gives readings manifestly superior to those of the Hebrew. In many passages in which it differs from the latter, it has the approval of the Septuagint. This chronology differs from that of the Hebrew Pentateuch. (Hales’s Analysis of Chronology, vol. i., p. 272.) In Deut., xxiii., the Samaritan differs from the Hebrew by having Esau for Gerizim, and rice earad. This has been regarded as a reason for the Samaritan, in mourning national prejudices. But Dr. Kennicott has shown good reasons for preferring the Samaritan to the Hebrew in this case. (Diss., i., p. 20-163.)

PENTECOST, one of the three great Jewish feasts, so called from the fifty days which separated the day of Pentecost from the Passover. It was also called the Feast of Weeks, from its falling at the end of a series of seven weeks, reckoning from the Passover, and was held to commemorate the giving of the Harvest. It was a feast of thanksgiving for the harvest, at the end of which it fell, and among the sacrifices appointed for it were some of the first-fruits of the harvest. This festival lasted eight days. The laws relating to it are contained in Exod. xxiii. 16; xxxiv. 22; Levit. xi. 15-21; Num. xxvi. 20-31; Deut. xiv. 9-12.

PENTLAND FRITH. [CAITHNESS; ORKNEY ISLANDS.]

PENTOGRAPH. [PANTOGRAPH.]

PENTREMITES. [ÉCRINÈTES.]

Pepagosmeûs (Πεπαγομένος), or more properly DEMETRIUS PEGAPOMENOS (Ἀνδρόπτων Χαῖρετύρας), one of the latest of the Greek physicians, is the author of a short treatise on the Gout, which is still extant. Nothing is known of the events of his life, but as his work was composed of the theory and practice of the medical sciences, it must have been written between the years a.d. 1250 and 1282. ‘This discourse,’ says Freund (Hist. of Physic, vol. i.), though containing little extraordinary, and being collected out of other writers, chiefly Alexander, of whom he takes every opportunity of quoting, twenty of his works, is so long that it is by no means of the length, yet is far from deserving the character which M. Musuruz, his translator, bestows upon the author (by name unknown to him), of infans et elinguus, &c., as if he could not express what he meant. It consists of forty-five short chapters, besides the completeness of the digestive organs and excesses in the matter of diet, &c. (cap. 7). The morbid principle, which is the result, is directed by nature towards the weakened articulations (cap. 3). Hence it follows that sobriety and temperance are the only means of preventing the disease (cap. 10). With respect to the cure he seems chiefly to have trusted to enemas and cathartics, and gives several prescriptions, some of which are borrowed, and others are apparently original. He particularly recommends a drastic purgative called hermodactylus, which is highly praised by Alexander Trallianus (lib. xi.), and which Mr. Adams (in Barker’s ed. of Lempiere, 1838) considers to be a species of Colchicum Autumnale, a medicine still considered by some practitioners to be almost a specific in this disease.

De Podagra, was first published in Latin, by Marcus Musuruz, Rom. 1517, 8vo, with the title ‘De Podagra Libelli incerti Auctoris et Graeco in Latinitum conversus,’ &c. This translation is noticed in the Med. Arts Period. (1517, 267, fol). The Greek text was first published at Paris, ap. G. Morello, 1558, 8vo, with a Latin translation (probably) by Turnebus. The last and best edition is by I. S. Bernard, Lugd. Bat., 1743, 8vo, Gr. and Lat., which is accompanied with a new title-page. There is a French translation by Fred. Jamot, Paris, 1573, 8vo. The Greek and Latin text is also to be found in the tenth volume of Chartier’s edition of Hippocrates and Galen.

There is extant a treatise entitled διαγνωσμος των ἐν νησσω, νησον, και διανοιας, ‘Digestio Morborum in Renibus, evorum
que Curatio," which is commonly printed among Galen's works, but which is however manifestly spurious, as the author seems to be a person of another name, and his list of Galen's works, conjectures that Demetrius Pegasomus may have been the author, but, in the opinion of Frond and Haller, there seems to be no good reason for such a supposition. In Certain writers, "De Re Austria," published by Nic. Rigulien, in "De Re Austra," 1612, 4to., are two treatises, which are perhaps the works of this same Demetrius. One is entitled "Iopatomein, or τέλλος τον ἑρείαν ἀναποφές τοντες της εκμελλής, ἢ Κλαρνοφορία τοντες της ακρόν τεκνίας. Two other works of Curationis, in taining an account of the different species of hawks, the mode of catching and training them, the diseases to which they are subject, and the remedies proper for each. The other is called "Kouosofene, ἢ τον τοντες της εκμελλής." Curationis, in Curationis, is sometimes attributed to Plumeon. It has been several times reprinted, but is not of much worth. He attributes madness in dogs to a worm underneath the tongue.

PEPIN D'HERISTAL, so called from a place in the kingdom of Austria, or Meiz, called Heristal), or Pepin le Gros, was the son of Ansegisius, and grandson of Arnulf, who was duke of Austria in the reign of Dagobert I., afterwards bishop of Metz, and who was finally numbered among the saints. His mother was called Isodea, and she was the daughter of another Pepin, called the Old, or Pepin of Lander, who was Mair of the Palace under Dagobert I. and under his son Siegbert, king of Austria, was much respected for his personal character, and who died a.D. 640. Pepin le Gros became duke of Austria after the death of Dagobert II., after whose death, a.D. 679, he governed the country as sovereign under nominal allegiance to Thierry III., king of Burgundy and Neustria. Thierry however became dissatisfied with Pepin, who revolted and defeated him, a.D. 686, and obliged him to recognise him as Duke of Moire d'Paris, or in other words, the governor of the whole Frankish monarchy. Here begins the series of the "Rois faibles," or "do-nothing kings," who succeeded one another as mere crests on a pageant, till the Merovingian Frankish, had lost the real authority. Pepin ruled as such under Thierry: Childeric III., Childerch III., and Dagobert III., and thus made his authority respected, not only by the natives, but also by foreigners. He died in 714, having appointed his grandson Theodeaud to succeed him as Duke of Paris. But Charlemel, a natural son of Pepin, was proclaimed Duke of Austria by the acclamations of the people, a.D. 715, and in 719 he obliged Chilperic II. to acknowledge him as Duke d'Paris as his father Pepin had been. [CHARLES MEL II.]

PEPIN, king of France, called "le Broc," or "the Short," son of Charlemel, was Marle of Paris after his father's death, under the nominal king Childeric III., for the kingdom of Burgundy, which his father Charlemel, and governed that of Austria in a similar capacity. The two brothers defeated the Saxons, Bavarians, and Slavonians; and Pepin, in 744, defeated the Duke of Aquitania, who revolted. Soon after, Carlamon, in a fit of devotion, gave up the government of Austria, and retired to a monastery at Rome, where he ended his days. All the authority was now concentrated in Pepin. What followed has been briefly and obscurely told by the chroniclers: "King Childeric was dethroned, a.D. 720, his head was shaved (long hair was an essential appendage of royalty with the Merovingian kings), and he was confined in the monastery of Stithin, or St. Bertin, at St. Omer, and his son Thierry was sent to the convent of Fontenelle in Normandy, where he was brought up with great severity: History, "Histoire de France," Eginhard, the historian of Childerch, says, that "Borgarded, to the Duke of Wurtzgut, and the priest Fuirlad, a chaplain, were sent to Pope Zacharias at Rome, to consult him concerning the state of France, in which the kings had merely the name of kings, and the real power, and that the pope replied that it was better that he who exercised the royal authority should bear also the royal title; in consequence of which sanction, Pepin was constituted king." And the continuator of the chronicler, Fredegaruis, writing under the reign of Pepin, Chilperic, says, that "by the consent of the Frankish nation, supported by the sanction of the Apostolic see, the illustrious Pepin being consecrated by the bishops and recognised by the princes, was raised to the kingdom, together with his Queen Bertrada, according to the ancient usages." We have no cir-
custantial account of this important event, except that Pepin was anointed at Soissons, in March, a.D. 752, by Boniface, bishop of Mainz, who called the Apostle of Germany, before the assembly of the nation. It seems that the ceremony of anointing the new king was introduced on this occasion, having been unknown under the first or Merovingian dynasty. (Sismondi, "Histories," vol. i., p. 89.) It is asserted that, though the accession of a new family to the throne of the Franks was not a mere change of dynasty, nor the usurpation of one family over another, but that it was really a national revolu-

tion, the new dynasty, by the acquiring of the ancient titles of their leaders Pepin d'Heristal, Charles Martel, and his son Pepin, who conquered Neustria and the other provinces of ancient Gaul, and placed their own dynasty on the Frankish throne. During the two centuries and a half, which had elapsed since the first conquest of Germany by the Franks under Clovis, the conquerors had become mixed with the Gallo-Roman population, had adopted their lan-
guage, manners, and effemacy, and the original families of the Franks had almost entirely disappeared in Neustria, Aquitania, and Provence. But in Austria, which extended far on the right bank of the Rhine, had remained German. The family of Pepin led the Austrasian bands into the rest of Gaul, which thus received a fresh infusion of German blood which had been so greatly thinned in the north in order to conciliate the conquered Neustrians, raised Chil-
deric III., of the old dynasty, to the throne, but this pageant was in reality the king of the conquered, while Pepin re-
tained all the authority in his hands. The Neustrians looked on Pepin as a new establishment; the Austrasian, as his. When Pepin found that he could dispense with the puppet king, he put him aside with the sanction of Rome.

Pepin was grateful to the see of Rome, and when pope Stephen III., Zacharias's successor, applied to him for assis-
tance against the Longobards, he marched an army into Italy, defeated Astolphus, and made him promise to give up the Exarchate and Pentapolis to the Roman pontiff. [PAPAL STATE.]

Pepin waged successful wars against the Saxons, the Bri-
tanians, and other German nations; he defeated the Duke of Aquitania, and reunited his duchy to the domains of the crown; he favoured the clergy, and fixed the annual general assemblies of the Frankish nation for the month of May. He died of the dropsy, at St. Denis, in September, 747, at 63 years of age, in the 17th year of his reign. His son Charlemagne succeeded him as king of the Franks. [PIERIN, son of Louis le Débonnaire, and grandson of Charlemagne, was made by his father king of Aquitania, and died in 812, aged 83, without issue. His successors were Charles the Young, 838 or 839. The emperor disinherited Pepin's children of their father's kingdom, and gave it to his own son Charles the Bald.]

PEPIN, Lake. [MISSISSIPPI, RIVER.]

PEPO, a Latin term used by botanists to express that kind of fruit which the gourd is the type. It is an inferior seed- vessel, filled with pulp enclosed within a hard pericarp, and furnished with parietal placenta. It is a berry with a hard shell.

PEPPER. [Piper; Pimenta.]

PEPPERMINT. [Mentha Piperita.]

PEPSICH. JOHN CHRISTOPHER, an eminent musical theorist and composer, was born in 1667, at Berlin, in which city his father was minister of a Protestant congrega-
tion. At the early age of 16 his talent for music attracted the notice of the Prussian court, in which he held some ap-
pointment till he attained his thirtieth year, when, being eye-witness of a murderous act of tyranny perpetrated by disorderly banditti, he renounced his civil post, and visited Holland, where he remained upwards of a year; then proceeded to London, and about 1700 was engaged to take the harpsichord at Drury-lane theatre, and, it is supposed, practised in preparing for the stage Thomyris, as well as other opera pieces. He was the same time engaged in the music of the Greeks was far superior to anything that the moderns were capable of producing, yet he did not hesi-
tiate to compose much, and was successful; though but one of his many works is known to the present
cantata, 'See from the silent grove Alexis dies,' which has always been, and probably always will be, admired by every person of true taste.

In May 1726, this active and indefatigable musician, was one of the founders of the Academy of Ancient Music, which was formed so judiciously a plan that it subsisted upwards of eighty years. In 1712 he, together with Handel, was engaged by the Duke of Chandos (Pope's Tornello) to compose and conduct a grand masquerade, being followed in 1717 by his being admitted by the university of Oxford to the degree of doctor in music. In 1724 he was persuaded by Dr. Berkeley to join in the visionary scheme for establishing a college at the Bermudas, and actually embarked for the purpose; but the project was abandoned, and he returned to London. He now entered into the matrimonial state with the celebrated singer Signora Margarita de' l'Epine, who brought him a fortune, acquired by her profession, of ten thousand pounds. This addition—great in those days—enabled him to pursue his studies; he selected and adapted, with admirable skill, the music for The Heggara's Opera, for which he composed the overture. In 1731 appeared his Treatise on Harmony, which long continued a standard work, and is still read by those who are wise enough to make themselves acquainted with the best writers on the art. In the year 1737 he was chosen organist of the Charter House, an appointment he solicited more for the sake of the apartments and the learned and agreeable society it afforded than for the salary. In 1746 he lost his wife; his only son having died some time before. He now found relief in his studies, to which, and in giving instructions to a few favourite pupils, he devoted himself wholly. In 1746 was read before the Royal Society his account of the execution of No. 481, of the 'Philosophical Transactions' previous to which however he had been elected a fellow of that learned body. Dr. Pepusch died in 1752, and was buried in the chapel of the Charter House. His Memoirs, published in 5 vols. 4to, Lond. 1825, and since translated into several languages, contain a most curious and interesting collection of English ballads in five large folio volumes, begun by Selden, and carried down to the year 1700. Percy's 'Reliques' are but a part of this materialization.

Pepys had published 'Memoirs relating to the State of the Navy and Naval Affairs of England' from the year 1668 to 1669, and was elected president of the Royal Society, and held that honourable office two years. As a patron of learning, it may be sufficient to say that he contributed no fewer than 2500 guineas to the British Museum.

To Magdalen College, Cambridge, Pepys left an invaluable collection of manuscript naval memoirs, of prints, and antient English poetry, which has often been consulted by critics and commentators, and is indeed unrivalled in its kind. One of its most singular curiosities is a collection of English ballads in five large folio volumes, begun by Selden, and carried down to the year 1700. Percy's 'Reliques' are but a part of this materialization.

Pepysian Library. [Magdalen College, Cambridge.]

Perea. [Palestine.] Perambulator, an instrument in general use for measuring distances on roads, for settling disputes concerning the charges of the drivers of hack-carriages, and for other purposes. It consists principally of a wheel upon which a scale is fixed, which shows the distance in feet, yards, and miles, of such wheel reduced into miles, furlongs, poles, and yards.

The carriage or stock is made of wood, and is about 3 feet long. At one end is a handle for the person who uses it, and the other is furnished with sockets in which the axle of the carriage is placed. The stock is run into a pin at the end of the axis of the wheel. The axis of the wheel is removed by four pins which form the pins into a similar pinion at the end of a rod which passes up the stock or carriage to the works beneath the diapason. Motion is communicated by means of this rod to a worm or micrometer-screw, which turns on a round for each revolution of the carriage-wheel of the perambulator. This worm works into a wheel of 80 teeth, which is moved forward one tooth for every 4° pole, and carries a hand or index, which makes one revolution for 40 miles. The axis of the stock is on the axis of the circular scale on the side of the case. The palns螺丝 are small pinions, which work into a similar pinion at the end of a rod which passes up the stock or carriage to the works beneath the diapason. Motion is communicated by means of this rod to a worm or micrometer-screw, which turns on a round for each revolution of the carriage-wheel of the perambulator. This worm works into a wheel of 80 teeth, which is moved forward one tooth for every 40 miles, and carries a hand or index, which makes one revolution for 40 miles. The axis of the stock is on the axis of the circular scale on the side of the case.
The instrument is furnished with a stop or strap, so that
after the distance is measured, the perambulator may be
conveyed without the index being altered.

Unlike the pedometer, it requires no regulating, and the
only risk of its giving the distance incorrectly, it well con-
structed, and precision by indubitable, which will of course cause the index to show more than the true
distance. In general however, for short distances, this
effect is very trifling.

When about to commence a measurement, the wheel
should be ten round until the first-mentioned index
points to 220 on the circle of yards. Some are provided
with a click and ratchet, by which this may be done with much
less trouble than by the wheel.

The movements for the same or similar pur-
poses, bearing different names, as: "strucpepe", and "odometer";
but the construction of all of them is very similar.

Waywis is the name generally given to that form of
the instrument which is applied to a carriage, in which, by a
slight adaptation to one of the wheels of the carriage, the
instrument is made to register the number of turns of such
wheel, in the same manner as the perambulator.

PERAMELES. [Bandicoot; Marsupialia, vol. iv, p. 437; and see further Professor Owen's paper "On the
Other Genus of Marsupialia" (Zool. Proo., 1838.).

PERCEPTION is that power or act of the mind by which
it holds communication with the external world. It is dis-
inguished from conception by the circumstance that its
object, or the existence supposed or asserted to have an aspect
or existence. We may conceive things that have no reality,
but we are never said to perceive such things. Perception
differs from consciousness in that it takes cognisance only
of objects without the mind. We perceive a man, a house,

a tree, a sound, or feel a touch, to give but a few examples of
the hundreds of our perceptions, that are but faintly reflected in
our thoughts and emotions. It is further supposed in perception
that the objects of it are present. We can remember
former objects of perception, but we do not perceive them
again until they are once more present. Besides the sense
which has been explained, the term perception is sometimes
analogically employed in common speech in reference to
truths the evidence of which is certain. Thus we may per-
ceive the truth of a mathematical proposition. But Mr.
Hume is perhaps the only writer of eminence who designedly
applied the expression, and suggested the term itself, for any
other purpose or use.

The distinction between things perceived (sensibilis) and

things conceived (conceptus) was familiar to the Greek philo-

sophers and to their Latin expositors, of whom Cicero ex-

presses the former class of things by the phrases 'que

sunt et sunt, et per tangere possunt,' and the latter by the

phrases 'que tangi demonstrative non possunt, cerne

tamen animo atque intelligi possunt,' and gives examples of
each. (Top. v.)

The perceptive faculty is exercised through the instru-

mentation of the senses. We see by means of the eye, and

hear by means of the ear, and so in reference to the other

senses. An individual in whom these organs are wanting

or defective, will either not perceive at all, or perceive im-

perfectly. In only perception it is requisite that an

impression should be made upon the organ of the mind, in

the direct application of the object, or through some medium

that communicates with the object and the organ. Thus an

immediate application is necessary with regard to the sense

of vision; but only with regard to those of sight, hearing, and smell. The impres-

sion made on the organs of sense affects the nerves, and is

by them conveyed to the brain. The necessity of this com-

munication is ascertained by observation. If the nerve

approached by any organ be cut, or if hard, no perception

takes place; and the same result is noticed in certain disor-

dered conditions of the brain, even though the organs of

sense and the nerves perform their respective functions.

When however the conditions that have been specified are

considered, various theories have been formed to explain the func-

tions of the nerves and brain in connection with perception.

It was imagined by the antients that the nervous fibres

are tubular, and filled with a subtle vapour named animal

spirits; that the brain is a gland by which this ethereal fluid

is thrown off, and that the nerves it is the object of the

office. (Reid, Essay ii., ch. 3.)

Des Cartes, who adopted this hypothesis, has described with great minuteness how all

mental operations and movements are accomplished

through the agency referred to. Dr. Bragg, in his Essay on

Theory, was the author of a new doctrine on this point. He

maintained that the nerves operate by vibrations, like musical chords, and thus conduct im-

pressions to the brain. Newton himself (Opt., qu. 23)

appears to have been inclined to a notion of this kind of

and the subject was again referred to him by one of his

as a query were afterwards amplified and defended by Hart-

ley. The latter supposed that 'external objects impressed

on the senses occasion, first in the nerves on which they

are impressed and then in the brain, vibrations of the

nerve corpuscles'; and that these vibrations are excited, propagated, and kept up

partly by the ether, that is, by a very subtle elastic fluid,

partly by the uniformity, continuity, softness, and active

powers of the modulatory substance of the brain, spinal

marrow, and nerves. (Observations on Man, part i., prop. 4. 5.)

Both Des Cartes and Hartley believed that by the action of the

nerves in the manner described by them, images of ex-

ternal objects were formed in the brain.

It is not necessary to enter into any of the hypotheses concerning these

phrases, as they are totally destitute of foundation. A sound theory must assign real and not imaginary

causes for the phenomena which it professes to explain; and such

causes must have a manifest competency to the effects

which they are intended to produce. Only those who want both of these essentials. Who can prove the existence

of the animal spirits of Des Cartes, or the vibrations of

Hartley; or, granting their existence, who can show any

correspondence between them and the formation of images

in the brain? We may say, indeed, that no human being

can assign any reason why it should do under these circumstances

irresolutely, and not under any other, further than that such is

the constitution of our nature.

If the act of perception be examined, it will be found that we obtain a great amount of information respecting

the object perceived. We discover that it has particular

qualities, as for example, that it is extended, that it has

figure, that it is hard or soft, rough or smooth, &c. The

perceptive act thus includes in its own nature the same

range of operations as the thought of all possible degrees.

In the light of twilight a body is dis-

cerned more obscurely than in the full light of noon day:

and more obscurely still in proportion as the darkness

deepens. The notion we get of an object by perception is

accompanied by an irresistible and immediate conviction of

its real existence. An object may indeed be perceived as

indistinctly as to leave us in doubt whether it be real or not.

If it be very distant, or involved in darkness, this may

happen. But when it is plainly perceived, there is, along

with the perception, a perfect conviction of its reality.

We can no more doubt of its existence than we can of our

own. And this conviction is immediate. It is not the result of a

process of reasoning founded on our perceptions, but inse-

parably connected with them, and as instantaneous as the

act of perception itself. All the philosophers have remarked

that the belief in the existence of the objects of percep-

tion is not more immediate and deeply rooted than is the

belief that they exist externally to us. They do not seem

to have investigated the mind itself, but to exist inde-

pendently of it all together. These are the universal experience of mankind, and may be verified by all

who choose to bestowed the slightest attention on the intima-

tions of consciousness.

It would be tedious as well as a useless task to dwell

minutely on the numerous theorems that have been framed

of perception. In certain important particulars nearly all

of them coincide; while individually, if not more im-

portant, they are for the


discernment of the

result of what is

whole.
which constantly emanated from bodies, and varied according to the confirmation of their originals. (Plut., Placc., Pat., l. iv., ch. 8, &c.)

In the second book of his 'Republic' (ad init.) illustrates the manner in which we perceive objects, by the figure of a cave, in which men lie bound, so that they can turn their eyes only to one part of it, where rays from a distant light stream in, and shadows of bodies, supposed to pass by, are thrown upon the wall, and the shadows also of the objects in themselves being invisible. He thus conceived that we perceive only the shadows of things, and not things themselves.

This opinion of Plato was substantially the same with that of his scholar Aristotle, and of the Peripatetics generally. (A. Sch., ii. c. 3) that as the senses cannot receive material objects themselves, they receive their images. These images are the only objects of perception to the mind. As impressed upon the senses, they are formed sensible objects, of which the mind becomes objects of memory and imagination, and are termed phantasms; still further refined, so as to be objects of science, they are named intelligible species.

The theory of Epicurus was little other than a modification of that of Aristotle. He said, as if it were

Locke employs an illustration of the manner of perception that space is not Vernon was of the mind, but things

"Methinks," he says, "the understanding is not much unlike a closet wholly shut from light, with only some little opening left to let in external visible resemblances, or ideas of things without. Would the pictures coming into a dark room, by the light falling from the object in occasion, it would very much resemble the understanding of a man in reference to all objects of sight and the ideas of them."

The similitude of Locke, or rather of Plato, may be applied to all the systems of perception that have ever been formed, by merely substituting ideas, and, in the case of Hume, impressions, for what were antiently denominated species and phantasms. All these theories agree in maintaining that species and phantasms become objects of both perceptions and of objects of imagination, and which we mediately discern. It may be sufficient to remark, that different authors, that they are diametrically opposed to the testimony of our own consciousness. Instead of informing us that images alone are the direct objects of our perception, consciousness intimates nothing respecting images at all. Unless its representations are absolute objects, or are in some manner connected with that of Plato—external to it, that we perceive; not images of objects, but the very objects themselves. This is a testimony to which we yield implicit credence. It is too cognizant and unquestionable to be set aside by reasonings of an inferior kind, far less by mere reasoning, from which it ceases, means a wooden staff.

One observation, intentionally deferred, remains still to be made respecting perception, namely, that it is greatly modified by habit and by the cultivation and development of the other powers. Thus the perceptions of a man and of a child, both contemplating a piece of complex machinery, under the prompting of the same impressions, the other completely ignorant of them, must in some respects considerably differ. In like manner the perceptions of a blind man, by means of those organs of sense which are unimpaired, are distinguished in many particulars from those of a person who has never been without the faculty of vision. Numerous instances of a similar kind might easily be specified. A full account of acquired perceptions, such as those alluded to, is still a desideratum in this department of philosophical inquiry.

PERCH or POLE.

This measure, though now mostly used as a square measure (a perch usually meaning a square perch, or a square of a perch in length and breadth), was originally a measure of length, arising out of the custom of measuring small portions of land by a staff or pole. The word perch probably goes back to an old Sanskrit word referable to the same root as our word braid or plait, but the pole with which land was measured not only differed very much in different countries, but in different parts

of the same country. Ducange and his editors find records of the use, in different parts of England and France, of perchs of 7½, 10 (the oldest English), 12, 15, 16, 18, 20, 21, 22, 23, and 27 feet. Here is but one perchal foot, equal to 5½24 MILES and LEAGUES, of the tendencey of measures to lengthen. Forty perchs (quarantena), under the name of forty-long or forlong, became a common measure of length: and a piece of land forty perchs long and one deep, was called pericula. In Flanders and Picardy, cited by Du Cange, the same, though afterwards received into the system of measures which ends with the mile, originally formed no part of it whatever. [MILE."

By an early statute, entitled 'Compositio Ulmerum et Perticarum,' the perch was fixed at 16 feet, or five yards and a half; and four percticae (though that word is not used) were defined as an acre.

A perch is the quarter of a chain, and a square perch contains 30¼ square yards.

PERCHE, LE, a province of France, united, before the Revolution, with Maine, into one military government. It was bounded on the north by Normandie, on the north-east by the Isle de France, on the east and south by Orléans; and on the west by Maine. It was subdivided into Le Grand Perche, or Le Haut Perche (Great or Upper Perche), of which Mortagne was the capital; Le Perche Gouet, or Le Bas (Lower) Perche, of which Montmirel was the capital; Les Terres Françoises, of which Tour-Grisse, and Meung, were the capitals; and Thiers, of which Châteauneuf-Thiers was the chief town. Perche is now comprehended in the departments of Orne, Sarthe, and Eure et Loir.

Le Perche was governed by its own count from as early as 840; but the original county was not equal in extent to the province of later times. Having fallen to the crown, this county was given with that of Alençon to Pierre, one of the younger sons of St. Louis (A.D. 1268); and these counties having fallen to the crown, they were again bestowed on Charles de Valois, brother of Philippe le Bel (A.D. 1293), in whose family they long continued. In 1361 they were separated, Perche going to a younger branch of the family; but in 1404 they were again united to the crown.

In the reign of Francois I. the county was, on the death of the last male heir, seized by the crown, but the justice of this claim was for awhile disputed. During the dispute the widow of the late count was allowed to possess the county, but it was afterwards annexed to the crown domain.

PERCIDE, or Percides of Cuvier, a family of An- thopterygian fishes, of which the common perch may be regarded as the type, that is to say, the fishes of this great group, which ought perhaps to be regarded as an order distinct from the others, are the perch as in general form: they have the body covered with scales whose outer surface is more or less rough, and the free margins of which are denticulated; the operculum and branchiostegal membranes are denticulated, and denticulated at the outer margin; they not only have teeth in both jaws, but the vomer and palatine bones are also furnished with them: the number of rays to the branchiostegous membrane varies from five to seven; they never fall short of the lower nor exceed the higher number. The flesh of these fishes is generally well flavoured and wholesome. They inhabit both salt and fresh water.

The first division of the Percides, according to Cuvier, comprises all those species which have the ventral fins placed against the rayed tail. These rays are armed with spines and denticulated, the branchiostegous rays, and two dorsal fins. This section includes the following genera:—

1. Percis proper, in which the preoperculum is denticulated; the operculum is produced behind into a flattened protuberance; it is furnished with a series of short, thick, and strong spines. The tongue is smooth. Example, the common perch (Perca fluviatilis of Linnaeus). (Yarrell's British Fishes.) Closely allied to this is the P. italicus of Cuvier and Valenciennes, a species found in the navigable tributaries of some parts of Italy: it differs from the common perch in having a shorter and deeper form, and is destitute of the black bands. Several true perches are found in North America: species have also been discovered in Java and New Zealand:

This article (p. 233) "periculae" is erroneously written for 'pericles.'
2. **Labrax** (Cuv. and Val.) differs chiefly from the true perches in having the infra-orbitals denticulate as well as the suboperculum. The operculum (which, as well as the preoperculum, is entirely covered with scales) has two spines on the posterior part, and the tongue is furnished with minute teeth. [**Labrax**.]

3. **Lates** (Cuv. and Val.), a genus also closely allied to *Perca* proper, in fact differs only in having the infra-operculars more or less denticulated as well as the suboperculars; the infra-orbitals and supratemporal spines are observable on the angle of the preoperculum; the anterior dorsal is shorter and higher than in the perch; the tongue is smooth, as in the last-mentioned fish.

The fishes of this subgenus are usually of large size, good eaters and are found in the rivers in the warmest parts of the Old World.

4. **Centropomus** (Lacépède) includes those perch-like fishes whose operculum is produced behind, but the produced part is rounded at the apex; in the fins and denticulated preoperculum they resemble the perch. In the only species of this genus hitherto discovered the head is more pointed than in the preceding genera. [**Centropomus**.]

5. **Leucoperca** (Cuv. and Val.) differs from both the preceding genera in having larger and more sharply-defined infra-opercular spines, in the form of the body is more elongated, and the first dorsal fin is large. The *L. Sandra*, C. and V., is found in the rivers and lakes of the north-eastern portion of Europe, and is known to the genera of Sandor, Schott, and Schulte; the *Schip of the Austrians, and the Nagmual of the Bavarians*. A second species, the *L. Volgensis* of Gymnich, inhabits the rivers of Russia, and a third is found in the United States.

6. **Huso** (Cuv. and Val.): this genus is founded on a fish described under this name, in which most of the essential characters of the perches, differs in having the operculum simple, a character in fact not found in either of the other genera here described. The species alludes to Lake Huron, and is called by the inhabitants the Black Bass: it is considered one of the best flavoured fishes of that lake.

7. **Etheos** (Cuv. and Val.): in this genus, as in *Leucoperca*, there are larger teeth intermixed with the ordinary minute ones, but here the larger teeth are confined to the jaws, and the intermixed smaller teeth are confined to the pectoral and pelvic fins. The species are called as in *Leucoperca*; the operculum is terminated by two spines, whilst in the genus just mentioned it is simple. Only one species of Etheos is known; its body is elongated, the muzzle is rather obtuse, the eyes very large, and the posterior dorsal fin long. A third fish (the *E. canaricus*, C. and V.) is remarkable for its brilliant red colour, and is adorned with longitudinal golden stripes. It is found in the region of the Seychelles Islands, north of Madagascar.

8. **Niphon** (Cuv. and Val.): this genus is founded on a single species found in the Japanese Sea, and is remarkable for the large spines with which the operculum are armed; the preoperculum is strongly denticulated at its margin and furnished with a desirable number of spines. There are three of these spines; the first dorsal is large, and its spinous rays are strong; the body is somewhat elongated, and the head is pointed. The authors last quoted apply to this species the name *N. spinosus*.

9. **Enoplosus** (Lacépède) is also founded upon a single species (from Australia) originally described in White’s 'Journal of a Voyage to New South Wales,' in which work the fish is mistaken for a *Cheldon*, no doubt from its short, deep, and compressed form, and produced muzzle. Like the *Niphon* it has two dorsal fins, but these are much extended in the vertical direction; the third ray of the first dorsal is very large, and long, and the six anterior rays of the second dorsal are also much elongated; the infrabasal is denticulated, and so is the preoperculum which has a kind of a matted spine; the posterior dorsal fin is simple, i.e. destitute of spines: it is the *Enoplosus armatus* of Cuv. and Val., a fish of small size, being seldom more than eight or ten inches in length, the body is armed with brown or green black bands on a silver ground; some of these bands however are abbreviated.

10. **Disopron** (Kuhl and Van Hasselt), like the two preceding genera, contains but one species (Disopron bifasciatum of the authors just quoted). This fish is a slender one, and a little larger in length, and somewhat somewhat somewhat more than eight or ten inches in length, the body is armed with brown or green black bands on a silver ground: some of these bands however are abbreviated.

11. The infra-orbital is entire, the preoperculum is dentate, and the operculum is armed with three strong spines. It is found off the coast of Java.

12. *Chelidonius* (Lacépède) is the only species of this genus, and is much smaller than the species just described; it has a small head, the body is armed with brown or green black bands on a silver ground; some of these bands however are abbreviated.

13. *Chelodiscus* (Lacépède) has a larger pointed tooth mixed with the ordinary ones; the preoperculum is dentata, and the operculum is entire. [**Chelodiscus**.]

14. Pomatomus (Cuv. and Val.) is the only species of this genus, and is entirely covered with small scales; the body is somewhat elongated and thick; the head is large, and the eyes very large; the scale is with scales; those on the body are large and easily dislodged.

Only one species of this genus is known, the *Pomatomus telescopicus* of Risso, and this is said to be exceedingly rare, living, it appears, in very deep water. The species states that it has a thick, short, and broad head, which is entirely covered with scales; those on the body are large and easily dislodged. The material from which MM. Cuvier and Valenciennes’s description is taken was about twenty inches (French measure) in length. The colour of this fish is brownish-violet, and red and red in the elongated spines. The authors just quoted appear to have been quite satisfied as to the true affinities of this genus.

14. *Ambassius* (Cuv. and Val.): this genus is founded upon a small fish found said the coast of the Middle Atlantic; the principal characters consist in the double series of denticulated spines on the lower portion of the preoperculum, a denticulated infra-orbital, a protracile mouth, and a small and delicate spine in front of the first dorsal fin, the post: of which is directed forwards. In the form of the body it approaches the common perch. It is the *Ambassius Amurica* (Cuv. and Val.), which has been taken off the Malabar coast, and there are several in the Indian seas, most of which are described by Hamilton, in his Acaen of the Fishes found in the River Ganges and its Branches, under the name *Chital.*

15. *Aspro* (Cuv. and Val.): the species of this genus have the body elongated, slender, and approaching to a cylindrical form; the eye is moderate, and placed in the upper part of the head; the mouth is oblique, and the section of the first dorsal is large, and the first and second dorsal fins are widely separated, and the ventral fins are large. Two species are known; one found in the Rhone, the Sado, and some other rivers of France, is about six to seven inches in length, of a reddish or yellowish brown colour, and has four black bands extending across the back. It is the *A. vulgaris* of Cuv. and Val., and *Perca aspro* of Linn. A second species of *Aspro* (the *Z. singel. C. and V.?) found on the Danube and its tributaries, attains a much larger size.

16. *Grammistes* (Cuv. and Val.): the species composing this genus have small scales; their operculum and preoperculum are armed with spines, but not denticulated; the anal fin has no distinct spinous rays; the body is unarmed moderately deep, somewhat compressed, and suddenly in the posterior dorsal; the head is large, and the eyes moderate, and the first and second dorsal fins are placed near each other.

*Grammistes orientalis* (Cuv. and Val.), is of small size, its colour is deep brown, and the head and body are adorned with numerous longitudinal white spots. The number of these spots, white and black. Inhabitants the Indian seas. This genus terminates the division of the Percoideæ of Cuvier and Valenciennes;*
The second division comprises those species in which the first or spinous dorsal is united with the second or soft-rayed dorsal, so as to form one continuous fin, and is composed chiefly of the great genus Serranus. [SERRANUS.]

The third division comprises those brochiform fishes which differ from the preceding in having less than seven branchiostegal rays. The principal genera contained in this division are noticed under the proper heads; like the Serranids, they have the first and second dorsal fins united, but the spines are small and are to be distinguished by their single spine and soft-rayed portion. The fourth division is composed of such species as have more than five soft rays to the ventral fins, and more than seven branchiostegal rays. It contains the following genera: Cuvier's genus (Cuv. and Val.), or fishes having the above characters, combined with a short deep and somewhat compressed form of body, which is suddenly contracted near the tail, and furnished with large and strongly serrated scales, the head large, the mouth also large, and the eye moderate; the operculum is destitute, and the operculum is serrated, and produced into a strong and large spine; there is a strong spinous ray in front of the ventral fins, and three or four spines in front of the anal, one of which at least is large, and generally never has more than three spines of the opposite generation. The species of this genus inhabit the tropical seas of both the old and new world, and are usually of small size, seldom exceeding seven or eight inches in length; their colouring is usually very brilliant. [C. vorax (Cuv. and Val.)].

In the fifth division of Perciformes the fishes of the ventral fins are placed in advance of the pectorals. It contains the genera Trachichthys, Polypterus, and Polyutus, in which there is said to be a double ventral fin.

In the sixth and last division the ventral fins are placed behind the pectorals. It comprises the genera Sphyraena, Paralepis, and Polypterus.

PERCIVAL THOMAS, M.D., well known for his writings on the structure of the human body, was born at Warrington in Lancashire, in the year 1740. He was brought up under the care of an elder sister, having lost both his parents at an early age, and received his education at the grammar-school of his native town. Having chosen the medical profession, he was admitted to the University of Edinburgh, where he studied for three years. He afterwards visited London and Leyden, and having spent some time in both of these places, he took his doctor's degree at Leyden in 1765. In 1767 he settled in practice at Manchester, and quickly met with great success, being highly respected by all classes for his professional talents as well as for his high moral and religious worth.

Amidst his professional avocations, he found time for the pursuit of many experimental inquiries on subjects connected with medicine and surgery. He was a member of the Manchester Philosophical Society, and was fond of scientific discussion, and was mainly instrumental in the foundation of the Manchester Philosophical Society. This institution originated in a weekly meeting of literary men. The proceedings of this society were published for the purposes of conversing and reading papers on medical and scientific subjects. A number of these communications, many of them by Dr. Percival himself, were collected and published in 1761, and were so well received, that a regular organisation, 'The Literary and Philosophical Society,' was established, of which Dr. Percival was the first president, and which has since numbered among its members many distinguished persons, and produced many volumes of valuable Transactions.

Dr. Percival endeavoured to establish public lectures on mathematics, commerce, and the fine arts in Manchester, but was not able to succeed. He devoted a considerable portion of his time during the later period of his life to the study of moral philosophy, and he published several popular works on this subject. In his religious tenets he was a strict dissenter from the church of England, but very of temperate and unobtrusive in his opinions. He died, universally respected by the inhabitants of Manchester, on the 30th August, 1804.

Dr. Percival published many works. Most of his earlier writings (which were chiefly on medical and philosophical subjects, such as the therapeutic actions of medicines, on which he made many experiments) appeared in the form of memoirs in the 'Philosophical Transactions' of London or Manchester, and were afterwards collected and published in one volume, which came out in 1767, London, 8vo., with the title of 'Essays, Medical and Experimental.' To this two other volumes were afterwards added, one in 1773, and the other in 1778. These essays went through several editions, and acquired the author considerable reputation. One of them is devoted to the consideration of the properties of the different preparations of cinchona. Dr. Percival arrived at the conclusion that an aqueous solution of the bark possessed the greatest efficacy; subsequent experience has verified this opinion. Another merit of his essays contains an excellent and complete account of the medical properties of colombo root; but the most interesting of them, which was first published in the third volume of the 'Manchester Philosophical Transactions,' consists of a record of his experiments on animals, and on medicines on the blood and other animal fluids. Besides the 'Essays,' we may mention some 'Observations and Experiments on Water,' London, 1768, 8vo.; 'Observations on the Poison of Lead,' 1774, 8vo.; 'Moral and Literary Observations,' 1777, 8vo.; 'On the Use of the Dyes,' 1785, 8vo.; 'On the Dyes of the Dyes,' 1790, 4to.; 'On the Use of the Dyes,' 1795, 8vo.; 'Medical Ethics, or a Code of Institutes and Precepts adapted to the Professional Conduct of Physicians and surgeons,' 1796, 12mo.; 'On the Use of the Dyes,' 1798, 8vo.; 'On the Use of the Dyes,' 1801, 8vo.; 'On the Use of the Dyes,' 1802, 8vo.; and 'On the Use of the Dyes,' 1807, 8vo. Besides what we have mentioned, Dr. Percival wrote many other papers on different subjects. All his works were collected and published by his widow in 1807. This edition is prefixed a memoir of his life and writings, and a selection from his literary correspondence.

PERCNOPTERUS. [VULGARIS.]

PERCUSSION, CENTRE OF, the point of a system of percussion or percussion, at which the force of determining the condition of the organs subject to the parts struck.

This means of diagnosis was first employed by Aven- brugger in the middle of the last century; it was afterwards extensively adopted upon the part to be examined, and to avoid cases of the heart, but its value, like that of all the other branches of auscultation, was not fully appreciated till Laen- nec made them the subject of his peculiar study. Since his time its value has been considerably enhanced by the labours of M. Perry.

Everybody knows that when a hollow body is struck, there is a vibration produced in the air within it, which being communicated through the walls to the external air, produces a ringing sound. When the surface of the body is touched the hollow body, the material of which it is composed, and many other circumstances; but that if the same body be filled with a fluid or a nearly solid substance, no other sound is produced than that which results from the striking itself; the number of two or three, according to the size of the cavity and the substance with which it is struck. On these circumstances the practice of percussion is based. If any part of the body beneath which there is a hollow organ, or one containing air in tubes, be struck, a resonance is produced; if any part which lies on the surface be similarly struck, the sound emitted is merely the dull noise of two solid and rather soft bodies.

The modes of employing percussion are various. The simplest and most convenient is to place one finger of the hand flat upon the part to be examined, and to strike it lightly but rather sharply with the ends of the three first

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fingers of the right hand set close together on the same level. Instruments called pleximeters have been invented by M. Pierry and others, and are sometimes, though now rarely used; they are composed of small plates of cork, india-rubber, light wood, or ivory, which are held either by their edges or by a handle, are placed on the part to be examined, and struck with the fingers, or with a small hammer. There is however no important advantage to be derived from the use of these instruments, and in my experience the common finger test is as important and more convenient. It is indeed sufficient to strike the unguarded surface with the ends of the fingers; but this method has no advantage to compensate for the pain which it sometimes produces, and which is effectively prevented by means of the finger of the left hand. Care should be taken that the blows are always given with the same or an exactly estimated degree of force, and that they should fall perpendicularly to the surface of the organ to be examined.

Percussion is chiefly employed in the diagnosis of diseases of the lungs, heart, and abdominal organs. The particular symptoms which are obtained by it in each disease are detailed, with their other signs, in the articles devoted to each. [Pneumonia is a number, but are all properly used only by a very practised ear and hand. To them the evidence they afford is scarcely less valuable than that obtained from the use of the stethoscope, with which the practice of percussion should, in all diseases of the chest, go hand in hand.]

When the chest is struck over the region of the heart, an almost palpable sound, which is audible to the ear, is produced, and this sound is transmitted to the ear when it is held close to the chest. The sound heard, when the chest is struck over the region of the heart, is more or less distinct, and is produced by the pulsation of the heart. The sound heard when the chest is struck over the region of the lung is a dull sound or a totally inaudible sound. The sound heard when the chest is struck over the region of the ribs is a hollow sound. The sound heard when the chest is struck over the region of the spine is a clear sound. The sound heard when the chest is struck over the region of the diaphragm is a sharp sound. The sound heard when the chest is struck over the region of the epiglottis is a soft sound. The sound heard when the chest is struck over the region of the liver is a resonant sound. The sound heard when the chest is struck over the region of the spleen is a dull sound. The sound heard when the chest is struck over the region of the stomach is a hollow sound. The sound heard when the chest is struck over the region of the intestines is a resonant sound. The sound heard when the chest is struck over the region of the bladder is a hollow sound. The sound heard when the chest is struck over the region of the kidneys is a resonant sound. The sound heard when the chest is struck over the region of the adrenals is a dull sound. The sound heard when the chest is struck over the region of the gallbladder is a hollow sound. The sound heard when the chest is struck over the region of the pancreas is a resonant sound. The sound heard when the chest is struck over the region of the spleen is a dull sound. The sound heard when the chest is struck over the region of the liver is a resonant sound. The sound heard when the chest is struck over the region of the stomach is a hollow sound. The sound heard when the chest is struck over the region of the intestines is a resonant sound. The sound heard when the chest is struck over the region of the bladder is a hollow sound. The sound heard when the chest is struck over the region of the kidneys is a resonant sound. The sound heard when the chest is struck over the region of the adrenals is a dull sound. The sound heard when the chest is struck over the region of the gallbladder is a hollow sound. The sound heard when the chest is struck over the region of the pancreas is a resonant sound.

Percussion, as just described, is of great service in the diagnosis of diseases of the lungs, heart, and abdominal organs. The sound heard when the chest is struck over the region of the heart is a sharp sound, which is transmitted to the ear when it is held close to the chest. The sound heard when the chest is struck over the region of the lung is a dull sound or a totally inaudible sound. The sound heard when the chest is struck over the region of the ribs is a hollow sound. The sound heard when the chest is struck over the region of the spine is a clear sound. The sound heard when the chest is struck over the region of the epiglottis is a soft sound. The sound heard when the chest is struck over the region of the liver is a resonant sound. The sound heard when the chest is struck over the region of the spleen is a dull sound. The sound heard when the chest is struck over the region of the stomach is a hollow sound. The sound heard when the chest is struck over the region of the intestines is a resonant sound. The sound heard when the chest is struck over the region of the bladder is a hollow sound. The sound heard when the chest is struck over the region of the kidneys is a resonant sound. The sound heard when the chest is struck over the region of the adrenals is a dull sound. The sound heard when the chest is struck over the region of the gallbladder is a hollow sound. The sound heard when the chest is struck over the region of the pancreas is a resonant sound.

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assassinated just at the time in Pall-Mall. She then mar-
rried, in 1662, Charles Seymour, duke of Somerset, who un-
terstood to relinquish his hereditary name, and to call him-
self and his posterior by the name of Percy. Such was the
determination to keep up the splendid name. Some time
after however the duke was released from the obligations,
and retained his name of Seymour.
The duke of Somerset had Algernon, his son and heir,
duke of Somerset, who was created, in 1749, earl of
Northumberland, with remainder to his son-in-law Sir
Hugh Smith, his literary executor. He married Elizabeth Seymour, his
only daughter and heir.
Sir Hugh Smithson became earl of Northumberland on
the death of his father-in-law, when he took the name of
Perceval. He was a member of the House of Commons.
From him descend the three existing peers of the family of
Percy, namely, the duke of Northumberland, the earl of
Beverley, and lord Prudhoe.
A large history of the family may be read in Collins's
Parliamentary History of England, in which are
recounted the most memorable events of the family.
He was educated at Christ-Church, Oxford, and early in life
obtained the vicarage of Easton Mauduit, on which he re-
signed, and the rectory of Wilby.
He had attended to the pursuits of literature by the publication of what
works are common to the translation of the Chinese novel,
together with other matters connected with the poetry and
literature of that people. This is a translation by him from
a Portuguese manuscript. This was soon followed by another
work, entitled 'Miscellaneous Pieces of Ancient English
Poetry.' He next published translations from the Icelandic
of five pieces of Runic poetry. These appeared in 1761, 1762,
and 1763. In 1764 he published a new version of 'Solomon's Stone,'
Antipater, Antiquities of the Jews,' and 'Key to the
New Testament,' which has been reprinted several times.
In the same year, 1765, appeared the work by which he is
best known, and which is indeed one of the most elegant and
pleasing works in the whole range of English literature, to
which he gave the title of 'The History of the Religions of Ancient
England.' It contains some of the best of the old English
ballads; many very beautiful lyrical pieces by the poets of the
Elizabethan period and the age immediately succeeding; a
few extracts from the larger writings of the poets of those periods;
the whole being admirably illustrated. There have been several editions of
it, the last of which is in a cheap form, in one octavo
volume.
The publication of so popular and pleasing a work au-
enced the attention of the author or editor, and particu-
larly the duke and duchess of Northumberland took
notice of him who bore their name, and in or about 1766 he
was appointed domestic chaplain in the family. In 1789 he
was made one of the chaplains of the king; in 1778, dean of
Canterbury, and in 1787, prebendary of St. Paul's.
During the period of which we have been speaking he
continued his literary labours. In 1770 he printed the
'Northumberland Household-Book,' and a poem, the subject of which was
connected with the above-named family, called 'The Hermit of
Warkworth.' In the same year he

PERIDICAS, the son of Oronites, was one of the gene-

eral of Alexander the Great, to whom that conqueror on his
death-bed delivered his royal signet, thus apparently un-
tending to designate him as protector or regent of his vast
empire. Alexander's wife Roxana was then far advanced
in pregnancy, and his other wife, Statira, the daughter of
Darius, was supposed to be in the same situation. In
the mean time the Macedonian generals agreed to recognize as
king, Arrhidaeus, a natural son of Philip, a youth of weak
intellects, with the understanding that if the child of Roxana should prove a son, he should be associated in the throne
with Arrhidaeus. Perdiccas contended himself with the
command of the forces which were appointed the guards of
King Arrhidaeus, but in that capacity he was in reality
the guardian of the weak king and the minister of the whole
empire. He distributed among the chief generals the go-

PERIDICAS, a Macedonian, was one of the

Orestes, Tydeus, and Antigonus; and Polye-

ymus had Egypt. For the distribution of the other
provinces see Justinus (xiii. 5). Roxana, being soon after deliv-
ered of a son, who was called Alexander, became jealous of
Statira, from fear that the child she was pregnant with
might prove a rival of her own son; and in order to remove her
apprehensions, Perdiccas did not scruple to put Statira
away, and to marry Roxana. Antipater, in order to strengthen himself by an
alliance with Antipater, whose daughter he asked in mar-
riage, while at the same time he was aspiring to the
hand of Cleopatra, Alexander's sister, Olympias, Alexander's mother, who hated Antipater, favoured this last alliance.
Antipater, having obtained this important measure,
proceeded to lead his daughter to Perdiccas, who, in the end obtained neither.
The other generals, who had become satraps of extensive
countries, considered themselves independent, and refused to
submit to Perdiccas and his puppet king. Perdiccas
thereafter devoted himself to the study of his own
views, sought to destroy him, but Antigonus escaped to
Antipater in Macedonia, and represented to him the
necessary unity among the ambitious views of Perdiccas.
Antipater, having come to terms with the Athenians, prepared to march into Asia,
and Perdiccas joined the confederacy against Perdiccas.
The latter, who was then in Cappadocia with Arrhidaeus and
Alexander the infant son of Roxana, held a council, in which
Antigonus and Polye
democracy, and the unity against the royal authority, the plan of the campaign
again, they arranged. Eumenes, who remained faithful
Perdiccas, was appointed to head against Antipat

PERIDICIDAE [Macedon].

PERIDICIDAE, or the house of a family, or, according to some,
a subfamily of Tetramodeæ, in the latter case the form should be Peridicidae.

The genus Peridix, Briss., in Mr. Swainson's arrange-
ment, is made to contain the subgenera Peridix (Partridge);
Trypetus (Trypetus); Otopterus (Otopterus); Coptarix (Coptarix); Tetrachlaerus (Tetrachlaerus); and Otopterus (Otopterus).

The Prince of Musignano (Geographical and Compara-
tive List) makes Peridice, the first subfamily of the Tetra-
modeæ, contain the genera Lophoryx; Bonap.; Orti-

Steph., Sw.; and Otopterus, Sw.

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tive List) makes Peridice, the first subfamily of the Tetra-
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tive List) makes Peridice, the first subfamily of the Tetra-
modeæ, contain the genera Lophoryx; Bonap.; Orti-

Steph., Sw.; and Otopterus, Sw.
thus preserved her brood a second time. I have also seen, when a kite has been hovering over a covert of young partridges, the old birds fly up at the bird of prey, screaming and fighting with all their might to preserve their brood.

Aristotle describes his Partridge (see post) as tumbling about to draw intruders from her nest, and fixing their attention till the young have time to escape. (Hist. Anim. x. 8.)

The pairing time is generally about the beginning of February, but notwithstanding the ardour of these birds, the attachment soon seems to be directed to another object, if any accident happen to that first selected; at least as far as the female is concerned. White mentions a sportsman who zeal for the increase of his game being greater than his humanity, he, afterpairing time, always shot the cock bird of every couple of partridges upon his grounds, supposing that the rivalry of many males interrupted the brood; he used to say, that though he had widowed the same hens several times, yet he found one fresh paramour that did not take her away from her harem.

The same delightful author states that he knew a lover of setting, an old sportsman, who had often told him that once after harvest he had frequently taken small coverts of partridges, in which there was a prodigious number of cock birds, all of which were used to call old bachelors. It thus appears that the number of males much exceeds that of the females: the rivalry between the amorous combatants in the spring—and these battles are long and bloody—would seem to be the usual provision to secure the strongest males for the continuance of the species. They roost on the ground together, generally in large fields, far from hedges or coverts; probably, as White observes, to secure themselves from pole-cats and stoats.

There are accidental pied or whitish variances.

Partridge.

The above form has been separated from the other partridges, Parus Gracca, Briass, Parus rubra, Parus pratensis, &c., by the Prince of Musignano. The first of these, Parus surcularis of Merle, La Bayarderie, is most probably the wood (Parus) of Aristote. All these, which are European, as well as Parus Chukar from the Himalaya mountains, have a rudimentary blunt spur on the tarax, which, with their general plumage and red legs and bill, seem to justify the generic name septata.

The Greek Partridge inhabits the Alps, the Tyrol, Switzerland, Italy, Turkey, and the Archipelago. Parus pratinus (the Barberry Partridge) is common on that part of the African coast and in the southern portions of Europe, especially those which are washed by the Mediterranean Sea. In the mountainous parts of Spain, and in the plains of Majorca and Minorca, Sardinia, Corsica, Malta, and Sicily, it is abundant; but it is rare in France, and is known in the north of Europe. Parus rubra, the common Red-legged of Guernsey Partridge, is common in Switzerland and Italy, rare in Switzerland, and still rarer in Germany and Holland. Mr. Gould observes that it is confined to the European continent and the islands of Guernsey and Jersey, but M. Temminck (Manuel, part iv.) states that it is found in Japan, where it was observed by Dr. Von Siebold, and M. Bürger, identical in form and colour of plumage.
has been introduced into our preserves, and is now rather plentiful in some parts, especially in Suffolk. But we doubt whether those who have introduced it have much reason to be pleased with the importation. They persecute almost to extermination the Common Partridge (Starna cinerea), a much better bird, whether regarded be to the sports of the field or the pleasures of the table. They are most detested by birds, several months are employed to injure the behaviour of a well-bred and well-born pointer or setter on the Red-legged Partridge; if anything can make him puzzle, that partridge will. Though the flesh is not so juicy as that of the Common Partridge, a well-fed pointer, the Red-legged partridge, split down the back and brained upon a good clear fire, is not bad eating. It is probably the Parisian of the ancient Italians. Martial (xiii. 76), in allusion to the insane epicureanism of the Romans, which seems to have valued more price than flavour, says

"Carus est Perdix; sic angiic ut magia."

Franconius. (Brise.)

Generic Character.—Bill stout, moderate in size, convex above, and slightly curved downwards at the tip. Natris basilar, lateral, partially closed by a naked orver-ching membrane. Tail of twelve feathers, moderate, slightly rounded. Feet naked, four-toed, tarsi of the male armed with strong blunt spurs.

This is the genus Piemontes of Wagler, and Catostomus of Swainson.

The rudimentary spurs of the Red-legged Partridges become in the Francolinus well developed.

Geographical Distribution of the Genus.—The old continent and islands. The form occurs in Europe, Asia, and Africa. The Francolinus are forest birds, perched on trees, and feed on seeds, bulbs, &c.

EUROPEAN FRANCOLIN.

The European Francolin, Le Francolin a collier roux of the French, Francolino of the Italians, Francolinus vul- garius, is a fine and handsome bird; and the plumage of the male adult male is rich.

Mr. Gould, who has given beautiful figures of the male and female, of the natural size, in his Birds of Europe, says:—'In the bird before us trace, or fancy we can trace, one of those unions through which the splendid-coloured Pheasants of the East are united to the sober-coloured Quails and Partridges of the European continent, its form and habits, with the latter, white-streaked, colour manifests a relationship to the beautiful Oriental genus Tragopan. The near relationship which we fancy exists between the genera Francolinus and Tragopan consists in the general colouring of the birds, in the conformation of the beak. Another section of the genus Francolinus, peculiar to Africa, exhibits also a form differing from these in the structure of the beak, in which particular, as well as in the uses to which it is applied in obtaining food, it assimilates to the Oriental genus Lophophorus; still between these groups we may yet expect to find others, harmonising with each so as to form a complete concatenation.'

We select Mr. Gould's description as being very accurate. In the male, the feathers on the top of the head are black, with a margin of yellowish brown; ear-coverts white; circle round the eyes, lower part of the cheeks, sides of the head and throat of a deep black, below which a broad chestnut collar extends round the neck; wings and back yellowish brown; each with a dark red and brown border except those of the quills, which are barred with this colour; rump and tail-coverts white, barred with black, as are also the middle tail-feathers, the outer ones being entirely black; breast and lower parts black; sides notched with black and white; thighs brown, base of tail-barred with black; undertail-coverts chestnut; beak black; legs reddish flesh-colour; tarsi spurred.

In the female the general ground-colour of the plumage is yellowish brown, darker on the cheeks and other feathers, and becoming paler on the upper parts; the feathers of the back and wings are marked as in the male; the breast and under surface irregularly crossed with barb-shaped marks of brown black; the rump and tail-coverts barred alternately with white and black; the male has a blackish bill, Koko-bi-tree.

Habits, Food, &c.—This Francolin haunts humid places, perches on trees, and feeds, like the Common Partridges (which, as Mr. Gould observes, it resembles in the form of the bill), on insects, seeds, &c., but not on bulbs, like others of the genus. M. Temminck, in the lately published part of his 'Manuel' (the fourth), mentions myrtle-berries and the tender tops of herbs among its food. Nothing particular seems to be known about its nest, &c.

Localities.—This species is widely distributed. M. Temminck, in the second part of his 'Manuel' (1820) states that it inhabits the most southern parts of Europe, Sicily, Malta, Sardinia, the kingdom of Naples, the islands of the Archipelago, and Turkey. The species is the same, he adds, throughout Asia and in the north of Africa, its haunts being marshes and prairies.

Mr. Gould says that in Europe its habitat appears to be exclusively confined to the southern regions, as Sicily, Malta, and the Neapolitan territories, but it is also found, he adds, in the north of Africa, and over the greater portion of the Asiatic continent. He had received it in collections from the Himalaya Mountains. M. Temminck, in the fourth part of his 'Manuel' (1840), remarks that it is not found in Sardinia nor in the kingdom of Naples, that it is still abundant in the humid spots between Caltagirone and Terranova, but almost entirely annihilated elsewhere. Individuals from Bengal and Persia differ in nothing, he adds, from those of Europe.

Utility to Man.—The flesh of this species is highly esteemed, particularly in India.

ASIATIC FRANCOLIN.

The Francolinus Puncticerius. Pardis Puncticeri of Latham, Ferrugineus and Grey Francolinus, appears to be confined to Asia.

This species, according to Colonel Sykes, is the Tettar of the Mahatts, and is called a partridge in the Dukhun (Docean), where it is the most common of birds, frequenting gardens and cultivated lands. The Colonel describes the irides as intense red brown, and its length, inclusive of the tail (which is three inches and six-tenths) as fourteen inches. He states that it is not met with in the Ghaats, unless in well cultivated valleys, and not at all on the mountains. It roosts on trees, in which situation the Colonel, on more than one occasion, shot them during the day time; but this was a rare occurrence. (Zool. Proc., 1832.)

Another Francolin, Francolinus spadicus, measuring with the tail (which is five inches) fourteen inches and seven-tenths, is very common in the thick brushwood of the Ghaats. Colonel Sykes had both sexes alive in his possession for some time, and has no doubt that they might be successfully introduced into Europe. He describes them as excellent eating, and says that they rarely take wing or perch. The male has a blackish tail, Koko-bi-tree, whence the Mahattian name (Koko-tree). The female in confinement uttered little notes, like the twittering of a chicken. A male in Colonel Sykes' collection had three
large spurs on one leg and two on the other. (Zool. Proc., 1832.)

AFRICAN FRANCOLINS. Africa seems to be the locality of several species of Francolin. Dr. Smith has figured four of his useful and beautiful work * now in course of publication.

We select *Francolinus pileatus* as an example.

Description.—Upper surface of the head rusty grey, clouded with brown; back and sides of the neck, together with the interscapulars, intermediate between brownish orange and reddish brown, the feathers of the former broadly margined with white, and those of the latter marked each with a broad white stripe along the centre; in some the stripe is divided longitudinally by a narrow black line, in others it is margined on each side by a brownish stripe; back and upper tail-coverts yellowish grey; the former faintly clouded with brown, the latter delicately mottled with very fine transverse lines of the same colour; shoulders hair brown, several of the feathers broadly edged with reddish brown, and all marked with a white stripe in the course of the shafts; primary quill-coverts and primary and secondary quill-feathers chocolate brown, with yellowish white shafts; the outer vanes of the primaries towards their bases margined with pale sienna yellow, or light reddish brown, and those of the secondaries, throughout their whole length, with white; over each eye a white stripe, which terminates at the nape of the neck, and beneath the eye another, which ends before the ear-coverts; these stripes in front of the eye are separated from each other by dark-brown blotch; chin, throat, and cheeks* white, the two latter delicately spotted with pale reddish orange; the breast and belly cream-yellow, the former marked with large fan-shaped, dark reddish-brown spots, and the latter closely barred with delicate undulated brown lines; vent and under tail-coverts pale ochre yellow, sparingly barred with zig-zag brown lines; two central tail-feathers light reddish brown, closely mottled with delicate waved brown bars; the remaining feathers dark umber-brown, except the outer vanes towards the quills, which are reddish brown, flecked with indistinct lines of a darker shade; bill dark horn-coloured; eyes reddish brown; tarsi and toes pale Dutch orange; claws and spurs pale horn-colour. Length, from point of bill to tip of tail, thirteen inches sixtli 3/16. (Smith.)

The female nearly resembles the male whose plumage is above described, but her tarsi are unarmoured.

somewhat Francolin on the banks of the Marikwa river, which flows in a north-easterly direction from Kurichana. 'It showed,' says Dr. Smith, 'but little disposition to resort to the jungle, though when disturbed in more open localities, which it by choice frequents while feeding, it, like *Francolinus Natalensis*, seeks concealment in the bosom of the thickets. Early in the morning specimens were observed in moderate abundance upon the open grassy plots which occurred in the wooded country along the sides of the stream, and there they appeared to find their food in plenty, which was found to consist of small bulbous roots, seeds, insects, &c. To the same localities these birds were also observed to resort towards evening; and at that period they were less readily discovered, owing to their being commonly more silent at that time. During the middle of the day they were rarely observed, and from what was ascertained there were grounds for believing they retire at that season of the year. There is also a certain species which, while the sun is warm, and that while resting they are generally perched upon trees, and are so doubt to be the more secure from the teeth of the numerous predatory quadrupeds which are constantly traversing the woods in quest of prey. *Francolinus Stemmefoni* is the same author, with its naked throat, wrinkled space round the eye, and more sombre plumage, seems to be a step towards some other orisonal forms, and to differ so much from its congeners as almost, if not quite, to justify separation.

Coturnix. (Briz.) We now return to the Partridge-like (Starna) plumage and bearing and the spurless legs of the smaller Perdix* which vernacularly known as Quails.

**Eurasian Quail.**—Bill naked at the base, slender, convex above, curved towards the end; no red eye-brow. *Turtus spurios.* Tail short. *Wings* rounded. First quill of equal length with the rest.

Geographical Distribution of the genus.—The Old World and Australia only.

**Eurasian Quail.**

Example, *Coturnix dactyloana*, Mayer (Tetrao *Coturnix*, Linn.; *Perdix Coturnix*, Latham.)

This well known bird, a species of which would be superfluous, seems to be the Ortix (sprat) of Aristotle, who mentions the bird repeatedly in such terms as its habits and migration as to leave little or no doubt on the point; and the *Coturnix* of the ancient Italians. It is the *quaglia* of the modern Italians; *castel* of the French; *Wachtel* of the Germans; Sfollor and Rhine of the ancient Britons; and *Quail* of the modern British; *Lokah* and *Looa* of the Malaitans.

Geographical Distribution.—The Quail is very widely distributed. 'No individual of the Gallinaceous order,' says Mr. Gould, 'enjoys so wide a range in the Old World as the Common Quail; it is abundant in North Africa, most parts of India, and, if we mistake not, China; while the whole of the southern portions of Siberia, and every country in Europe except those approximately to the parallel plains of Africa in search of more abundant supplies of food and a congenial breeding-place. So vast and countless are the flocks which often pass over the islands and European shores of the Mediterranean, that a mode of wholesale slaughter is usually put in practice against them, a circumstance which no doubt tends to limit their inordinate increase.'

These migrations have been noticed by the earliest writers on natural history. Thus Aristotle speaks of their autumnal departure in the months Boedromion and Maimaron (Hist. Anim., viii. 12). Belon speaks of finding them on the shores of the Mediterranean in spring and autumn at their arrival and departure, and of their flying on board his vessel for repose. Our in his passage from Rhodes to Alexandria he state of some that had been taken with cattle changed in their crops. Hassequist states that an amazing number of these birds come to Egypt in the month of March, when the 'tawer' ripens there. 'They conceal themselves,' says he, 'in the corn, but the Egyptians have extremely well that there are thieves in their grounds; and when they

Francolinus pileatus. (Smith.)

Locality, Habits, Food, &c.—The expedition under the direction of Dr. Smith saw the first specimens of this hand-

** Illustrations of the Zoology of South Africa.'
imagine a field to be full of them, they spread a net over the corn and surround the field, at the same time making a noise, by which the birds are frightened, and endeavouring to rise, are caught in the nets in great numbers, and make a most delicate and agreeable dish."

2. Von Siebold and M. Bürger mention a variety of this species as an inhabitant of Japan. M. Tommineck states (Manuel, 4th part) that those individuals which he had received from the last-named locality differed scarcely at all from those of Europe and Africa. He observes that the species varies in size and form from the habits of the female to the note on a quill-pipe; sometimes by the voice, but the performer must be a perfect mimic.

Habits; Food; Reproduction.—The ardent and pugnacious nature of Hasselquist as has been mentioned by him to be a new species of Tetrao; he found it at Jordan, and in the wilderness near the mountains of Arabia Petraea. Hasselquist describes it, in a letter to Linnaeus, as much resembling the red partridge, but not larger than a turtledove. 'I expect," says Hasselquist, 'to get a score of these birds, which were promised me by a person at Jerusaleth, whither the Arabians carry many thousands to sell at Whitsuntide. If natural history can give any information in the interpretation of the Bible, this bird is certainly the same with the Quails of the Israelites when they alone made a journey to Jordan; for my part, I was so pleased with this discovery as to forget myself, and almost lost my life before I could get one into my possession.' In his list of birds seen by him in the Holy Land, the Tetrao Israelitarum is again mentioned as having been met with in the deserts near the Dead Sea. Linnaeus, to whom Hasselquist's specimens as well as his observations were in all probability communicated, makes his Tetrao Israelitarum a synonym of his own Tetrao Communis, the Common Quail, and in this he is followed by Gmelin and others generally. Col. Sykes, who has devoted much attention to the Quails and Hemipodii, remarks that the fact of Coturnix dactylolimans being the only species of quail that migrates in multitudes is another reason for connecting it with the birds of Scripture, and indeed it announces it to be the identical species on which the Israelites fed. This is perhaps not the place to discuss such subjects, but it may be necessary to remind the reader that Rolbeck asserted that the living food which "after he came up and covered the camp" (Exod. xxi. 31) was a Flying-Fish. We dismiss this at once. Ludolph, who thought that the animal was a locust, is, at first sight, more worthy of attention; but the word " unwillingly" (sheer, ' flesh') (Psalm lxxxviii. 27) could hardly have been applied to locusts feeding on low bushes, and the translation used in the Hebrew word in Exodus is " Tom, Arabick selectis or select, a quail, and the Septuagint and Vulgate both lead to the conclusion that it was certainly a bird, and almost certainly a quail. See further Schuchert, Physica Sacra (vol. i, p. 173), where the Hebrew is translated upon both sides of the page 'coturnix,' as it is at p. 189; but these are referred to, tab. clix, represents the Israelites collecting locusts, and beneath the plate is printed 'Exod. xxi. 15, Selavim, Locustae.' In the very next plate however, tab. clxxi, representing many birds, we have the same chapter and verse quoted, with the following translation: 'Selavim, Coturnices, aliique.' Fig. 2 of that plate is no bad representation of a quail. There can be little doubt that Quails formed the seasonable supply; and, if this be admitted, we have, as Col. Sykes observes, proof of the perpetuation of an instinct (migration) through upwards of 3100 years, the fact recorded having occurred 1491 years before Christ.

The song of Quails is noticed by Athisaurus (Deptii, ix. xlviii. p. 392). Bechstein, among the attractive qualities of the species, reckons, besides the beauty of its form and plumage, the song of the bird as no sight recommendation to the amator. He states that in the breeding season the song of the male commences by softly repeating tones resembling "terra, terra," followed by "pericorte" uttered in a bold tone, with the neck raised, the eyes shut, and the head inclined on one side. Those that repeat the last syllables ten or twelve times consecutively are the most esteemed. The song of the female only consists of "terra, terra, "pulm, pulm," the two last syllables being those by which the male and the female attract each other's attention. The angry cry generally resembles, according to Bechstein, the word 'guilah,' but at other times it is only a purring murmurl. (Cage Birds.)

ASIATIC QUAIS.

Col. Sykes, in his valuable paper "On the Quails and Hemipodii of India" (Zool. Trans., vol. ii.), in which he states that he found the tongue and the gasea of birds to be of considerable importance in indicating affinities or dissimilarities between genera, notices Coturnicis dactylolimans, teuultis, Erythropyga, Argooondah, and Penatlas. Of these we select Coturnix Argoondah, the Rock Quail of Dukhun (Deccan).

Col. Sykes remarks that there are so many trifling variations in the markings of the plumage of the upper surface of this bird, that it is difficult to fix upon the exact type. 'The male,' he says, 'is readily distinguished by the numerous transverse narrow black bars upon the breast; but the female and the young have the bars, and vary so much in the markings on the back, that with those disposed to manufacture species from plumage alone, the eleven specimens before me from Dukhun would furnish at least four new species.' The reader however gives an elaborate and accurate description of the sexes (which scarcely differ in size) in a mature state, to which we refer the reader.

Food, Habits, &c.—Grass-seeds only were found in the stomachs of Col. Sykes's specimens. He states that they do not frequent cultivated lands, but are found all over the Dukhun on the general level of the country, amidst rocks and low bushes, and that they rise in coves of from ten to twenty or more, from under the feet, with startling suddenness and bustle, so that the young sportsman is perplexed in selecting his bird. They are gregarious, and, as Col. Sykes infers, polygamous; for he never saw them solitary or in
pairs. The flesh is perfectly white. Col. Sykes adds that this is the species used for Quail flights by the natives, and not Coturnix dactylisonus or C. textilis.

Before we notice the three-toed Hemipodius, we would call the reader’s attention to a group which supplies, in America, the place of the Quails in the Old World. Mr. Vigors (Zool. Proc., 1830, 1831) enumerated no less than eleven species (two of them, Ortix neozenus and Ort. affinis, new), stating at the same time however his doubts whether both might not be the same. The only fully known species is Ort. sommavni and Ort. cristatus. Only two

well-ascertained species had been known to ornithologists a few years back. He remarked that four individuals of Ortix virginianus, O. Californicus, O. neozenus, and O. Monsenau had been exhibited in a living state in the gardens of the Society. Specimens of the former three were, when he made his statement, still alive there, having braved the severity of the winter of 1829 without any artificial warmth. They were, he observed, all natives of the northern parts of America; and he added that Ortix virginianus had bred in this country, and had even become naturalized in Suffolk.

Mr. Vigors stated moreover that Captain P. P. King, R.N., had pointed out to him, amongst his collection, a bird last brought home from the Strate of Magalhaens, specimens of a bird which he made no doubt was the same as the Callae des Isles Malouines of Buffon, figured in ‘Pl. Enulm.’ (222), and which was subsequently named Perdix Pulkandica by Latham. This bird, Mr. Vigors observed, had been added to the genus Ortix by modern authors, but erroneously, as the structure of the wing, in which consists the chief difference between the Ortix of America and the genus Coturnix, or the Quails of the Old World, associates the Magellanic bird more closely with the latter than with the former.

Mr. Vigors also mentioned that the form which characterizes the true Quails extends to Australia, where several species are found. And referring to the deviation in form which partially separates the South American bird from the allied group of the same continent, and bringing it in contact with those of Australia, and through them with those of the old continent, he dwelt upon the beautiful series of geographical affinity which in this instance united the zoology of the southern extreme of New World with that of the nearest portions of the southern hemisphere, in like manner as the zoology of the northern extreme is united with that of the neighbouring continents of Europe and Asia. (Zool. Proc., 1830–31.)

Ortix. (Stephens.)

Generic Character.—Bill short, very high; culmen much elevated and curved, gonys thick and ascending; nostrile large, naked. Tarsus smooth; lateral toes unequal; no spurs. Tail moderate.

Geographical Distribution of the Genus.—America only.

Example, Ortix virginianus, Virginian or Maryland Quail.

Ortix virginianus.

Description.—This, the Quail of the inhabitants of New England, the Partridge of the Pennsylvanians, has the bill black; line over the eye down the neck and whole chin pure white, bordered by a descending band of black, which spreads broadly over the throat; eye dark hazel; crown, neck, and upper part of breast red brown; sides of the neck spotted with white and black on a reddish brown ground; back, scapulars, and lesser coverts red brown, intermixed with ash and sprinkled with black; tertials edged with yellowish white; wings plain dusky; lower part of the breast and belly pale yellowish white, beautifully marked with numerous curving spots or arrow-heads of black; tail ash, sprinkled with black, very pale ash. Length fourteen inches; extent fourteen (mean). The female differs in having the chin and sides of the head yellowish brown. (Wilson.)

Locality; Habits; Reproduction; Utility to Man.—Wilson says the Quail is a known bird a general inhabitant of North America, from the northern parts of Canada and Nova Scotia, to the extremity of the peninsula of Florida; and that it was seen in the neighbourhood of the Great Osage village, in the interior of Louisiana. They are, he says, great nesters, numbering from 12 to 18 in a nest. They are known for their introduction into the island of Jamaica, where they threw greatly, breeding twice in the year; he also quotes Captain Henderson as authority for their abundance near the Saline, at the Bay of Honduras; but there is something in the style of Wilson that makes it almost unpardonable not to give his own words, and, in justice to that most graphic describer and the reader, we shall permit him to go on with his interesting history of this bird in his own way.

‘They rarely’ continues Wilson, ‘frequent the forest, and are much more numerous in the borders of plantations where grain is in plenty. They however occasionally seek shelter in the woods, perching on the branches or secretating among the brush-wood; but they are found almost everywhere in open fields, and fly in small flocks. They return early in the spring, and often suffer extremely by long hard winters and deep snows. At such times the arts of man combine with the inclemency of the season for their destruction. To the ravages of the gun are added others of a more insidious kind. Traps are placed in the grain, and men and boys, sneaking along, turn out to their native fields again, to be pnt to death at some future time secundam atrim. Between the months of August and March great numbers of these birds are brought to the markets of Philadelphia, where they are sold from 12 to 18 cents. a-piece.’

‘The Quail begins to build early in May. The nest is made on the ground, usually at the bottom of a thick tuft of grass that shelters and conceals it. The materials are coarse grass and dry grass in successful, is honANELABLE. It is well covered above, and an opening left on one side for entrance. The female lays from fifteen to twenty-four eggs, of a pure white without any spots. The time of incubation has been stated to me by various persons at four weeks when the eggs were placed under the domestic hen. The young leave the nest as soon as they are freed from the shed, and are conducted about in search of food by the female; are guided by her voice, which at that time resembles the twittering of young chickens, and sheltered by her wings in the same manner as those of the young of the sparrow, with all that secrecy and precaution for their safety which their helplessness and great danger require. In this situation, should the little timid family be unexpectedly surprised, the utmost alarm and consternation is instantly prevail. The mother throws herself in the path, standing aloof, beating the ground with her wings, as if sorely wounded; using every artifice she is master of to entice the passenger in pursuit of herself, uttering at the same time certain peculiar notes of warning, and always safe beneath the young, who dive separately amongst the grass, and escape from the danger as till the danger is over; and the parent, having decoyed the pursuer to a safe distance, returns by a circuitous route to collect and lead them off. This well-known manoeuvre, which nine times in ten is successful, is remarkable to the feelings and judgment of the bird, but a severe satire on
Example, Lophortyx Californicus.

Description. (Male.)—General colour of the upper part of body and wings dusky brown, becoming of a lead or slate colour on the tail and on the fore part of the breast, upon which it advances in the form of a broad band. Fore part of the head mixed ash grey; hinder part blackish brown. Five or six black feathers, an inch and a half in length, the bars of which gradually widen upwards, rise from the hinder part of the head, and are reflected backwards so that the edges of the two opposite sides nearly meet each other. This crest stands erect for about half its length, and the remainder is curved gracefully forwards over the fore part of the head. Plumage of the back consisting of numerous small triangular feathers of a slate hue with a narrow black margin, and for the most part with a whitish tip. Between these and the throat, which is of a full black, there is a crescent-shaped stripe of whitish feathers ascending from the front of the neck and terminating on each side beneath the eyes. A second and smaller stripe of the same hue passes on either side of the head from above the eyes obliquely backwards. Feathers of the under parts from the breast downwards of a dull yellowish white with a tinge of brown, broad and deeply margined with crescents of dusky black. Legs covered as low as the knees with feathers of a rusty brown. Feathers of the sides of the body below the wings rather long, and each marked along the middle with a stripe of yellowish white. Bill and legs dusky. Size considerably larger than that of the European Quail: length from the extremity of the bill to the tip of the rounded tail nine or ten inches; height to top of crest eight inches.

Female.—Crest smaller; no whitish crescent bordering the throat, which is browner than in the male; general hue of the plumage fainter and the markings less lively. (Bennett.)

Locality.—California.
keeper would, we doubt not, soon have a young brood to
show, and that once obtained, he would not be long before he
would be able to turn out these graceful birds, whose habits
appear to be similar to those of the Quails and some of the
Partridges.

Hemipodius. (Tomn.)

Generic Character.—Bill moderate, slender, straight,
very much compressed, curved towards the point; nostrils
basal, lateral, linear, slit longitudinally down to about the
middle of the bill, and partially closed by a naked mem-
brane. Torus long; only three toes, all of which are
directed forwards and entirely divided. Tail-feathers weak,
hidden by the upper covert. Wings moderate; first quill
longest.

This is the genus Turnix, Bonn.; Tridactylus, Lacép.;
and Ortigia, Ill.

Geographical Distribution and Habits of the Genus.

Europe, Asia, Africa, Australia, and Oceania.

Mr. Swainson makes the genus Ortigia the third of his
family Tetraonidae, and places it between Odontophorus and
Tetrao. Mr. G. R. Gray elevates the form into a sub-
family, under the name of Turnicinae, the first of his family
Tinamidae, the second and other subfamily being
Tinaminae. The Tinamidae are followed by the Struthio-
mine in his arrangement. Colonel Sykes, in his paper On
the Quails and Hemipodii of India, speaking of Hemipodius
pugnax, says that its muscular stomach and proportionally
long intestines, compared with Otis, would prevent its being
placed in that genus; but its cursorial habits and the form
of its bill would justify its displacement from the Tetrao-
idae, and it might come in after Otis in Struthionidae. The
food of the genus consists of insects and seeds, and the birds
generally frequent high herbage, in which they run with
great speed. We proceed to give Asiatic and African
examples of this genus.

Astartic.

Colonel Sykes, in his paper above alluded to, describes
three species—Hem. pugnax, H. Tuigoor, and H. Ostu-
meri. In the stomach of the first he found the remains of
black ants, minute coleopterous insects, and grass-seeds; the
flas hit in brown and white layers, and the Colonel states
that its pugnacious qualities are quite unknown in Dukhun,
and even in Java. They were frequently in pairs, but
mostly solitary, haunting cultivated lands, especially chillee
fields, and rice paddies. Their flight he describes as
lazy and short, nor are they readily put on the wing. He
adds that the Zoological Society has a specimen from
Madras, and that it would appear therefore to have an ex-
tended geographical range over the Eastern islands and
India. We shall presently notice H. Tuigoor, Ostumeri, the
Button Quail of European sportsmen in India, he says that it
affects short thick grass and fields of pulse of
Dolichos biflorus, Phasalus Maxim., and Evera Lens. He
never found the bird otherwise than solitary, and says that
it is so difficult to flush, that it not unfrequently rises from
beneath the feet; and when on the wing, its flight is so
abrupt, angular, and short, that it is generally down before
the gun is well up to the shoulder.

Example, Hemipodius Tuigoor.

Description.—Chestnut above; feathers margined with
straw colour, and with undulated bands of black; wing
covers straw-colour banded with black; quill brown, &c.
and throat white, breast banded with black and white, above
and vent down to first thighs, dull yellow with black
bands. Length of the body four inches eight-tenths, of the
tail inch seven-tenths. (Sykes.)

Colonel Sykes was at first disposed to regard this species
as H. pugnax in an immature state; but subsequent obser-
vations convinced him to consider it as distinct. The meas-
urements correspond closely with those of H. pugnax, but
is on the whole much less robust.

In the species of Turnix, or Hemipodius, described by
Colonel Sykes, the sexes do not appear to differ in plumage.

African.

Example, Hemipodius Lepuranus. (Smith.)

Description. Colour. (Male.)—Above, the ground-colour
is intermediate between pale brown and a slightly greyish
shade of the upper surface of the head the feathers are indistinctly
barred with brown; on the neck, back, and shoulders nearest to the body, they are crossed by numerous slender
black-brown bars or irregular crescents, and some of the
shoulders have long wing-covering pale yellow. The eyes are
black. The eyebrows, sides of the head, and a stripe between
the base of the bill and nape of the neck rufous white, the
feathers of the two first finely tipped with brown.
The inner vanes of the secondary quill covers pale buff; the
outer vanes of the same are broader, and more finely edged, on the back of the latter (three of them) are crossed obliquely near its point by a well-defined
brown bar, the inner extremity of which terminates at an
acute point. Primary quill covers dark brown; the pri-
mary and secondary quill feathers greyish brown, the inner
vanes of the latter are broader finely edged, on the back
of them are crossed by three or four finely edged, and those of the latter broadly edged with cream yellow, and
partially barred with the same colour. Tail pale rufous,
crossed by numerous delicate waved brown lines. Crown
and throat dull white; the middle of the breast pale dusky
orange, with a few minute brown dots; sides of the breast
and belly white, with a yellowish tinge, each feather with
an arrow-shaped brown spot near its point; centre of the
belly and the thighs white; vent and under tail-coverts
very pale buff orange; bill and legs pale blue; eyes pale
dark brown.

Form, &c typical; bill moderately long and slender; a
form approaching that of the smaller Rails (Pratia,
Vieill.) tail rather elongated, graduated, and more
slender, when folded, reach nearly to the commencement
of the last joint of the middle toe; tail-feathers slimmer,
the outer pair longest and nearly of equal length; the
secondaries slightly shorter than the longest quill feathers;
strap-like, slender, in front coated with two rows of scales, and
bead of the first, and pointed at the end; clasp of a slender
band, a little everted, the tips closely covered with feathers to the
blue and white. Length, from the point of the bill to the tip of the
tail, inches.

Female.—The crown of the head sparingly sprinled with
white dots, otherwise as pale as male, the back of the neck
is pale cinnamon-brown, the feathers edged with white
back a pale fawn colour, each feather crossed by seven
black bars, and each bar with a more or less distinct
projection at the shaft of the feather both before and be-
hind, one or two being rudimentary; secondary wing-feathers yellow, each with an oblong deep brown spot on its
sides, and a large irregular chestnut blotch on the inner
continuous with the brown spot. Primary and secondary
quill feathers brown, the two outermost primaries and
the middle pair the basis of being single and pointed at
both ends, but have them of an ovate form, and placed longitudinally
on the feathers. (Smith.)

Locality, Habits, Food, &c.—Only a very few specimens
of this quail, says Dr. Smith, were obtained, and he does
not until after the expedition had reached the country of the
Latakoo. The grassy valleys south-east of Kurrn were the
only localities in which they were discovered, and even
then they appeared to be but thinly scattered, for m. r. L.
Latakoo.

Single individual was seldom found in or even near the
nest,
Dr. Smith remarks that in the museum of the Army Medical Department at Fort Pitt, Clitham, there are the male and female of an Indian species of Hemipterus very closely resembling the Doctor's Hemipterus Leparama. They differ however, he observes, in so many minute points, that he feels disposed to regard them as belonging to a distinct species. In the catalogue of the Fort Pitt collection, Dr. Smith has named this Asiatic species Hemipterus Sphyrius, in honour of Col. Sykes, who, he justly states, has added so much to our knowledge of the zoology of India.

Illustrations of the Zoology of South Africa.

Before we quit this sketch of the Partridges, Quails, etc., we must notice two forms which particularly demand attention as leading to other types. The first of these, the Sanguine Partridge, Perdix cruenta (Pl. Col., 333.), appears to bear the following generic names: Ithaginis, Wagler, Ectoprosopus, E. G. Gray, and Plophus, Sw. It is described as a pheasant in Linn. Trans., vol. xiii., and may be considered as uniting the Partridges with the Pheasant and the Polyplectron, like the latter of which, it has often more than one spur upon the tarsus. The plumage of this bird, which is a native of Nepal, is brilliant, and the feathers of the head and neck are elongated.

The second, the Tern, A. Ternus, described by Mr. Hodgson (Zool. Proc., 1833) inhabits, according to that gentleman, the northern region of Nepal, and forms by its half-plumed tarsus a sort of link between the Partridges and the Grouse, the latter of which it resembles in its habits. It is found close to the permanent snows, among rocks and low brushwood, feeding upon aromatic buds, leaves, and small insects. The plumage is black, linearly transversely with white and chestnut; the breast is brown. Mr. Hodgson remarks that the great comparative expansiveness of the wing, the diminution of its rounded form by the second quill feather being the longest, the increased length and strength of the tail, and the extent of the feathering of the tarsus, are very remarkable characters, which give to this species a strong interest.

PERDICINÆ. [Perdicidæ.]
PERDIX (Ornithology). [Perdicidæ.]
PERDIX (Conchole.) De Montfort's name for the Partridge Tuna (ex. Dusin Perdix of authors). [Entomophylax, vol. p. 446.]
PERDU, MOUNT. [Pyreness.]
PERECOP. [Crima.]
PERENNIBRANCHIATA. [Amphibia; Anot.]
PROTEUS; REPTILES. [Reptilia.]
Pizzi, A. T. A. (Ion) was the natural son of Gonzalo Perez, a distinguished writer* and statesman who had been

* He transcribed the "Odyssey" of Homer into verse, which was printed for the first time at Venice, 1542, 1548.

for forty years sole secretary of state to Charles V. and Philip II. After the death of his father, whom he used to assist in his administrative duties, he was appointed by Philip to succeed him in that charge. At first the confidence which his sovereign placed in him, and the favours lavished upon him seem to have been unbounded, but he soon experienced the inconstancy of royal favour. John of Austria, an illegitimate son of Charles V., elated with victories over the revolted Moors of Granada (Morisco), and still more by the glorious victory of Lepanto (1571), could not rest contented with the second place in the kingdom, and nothing short of a throne would satisfy his ambition. At first the king treated him as the monarch of the kingdom of Tunis to be held as duchy of the Spanish crown. A marriage with Elizabeth of England, the sworn enemy of Spain, was also secretly contemplated, and negotiations were carried on to that effect by his secret agents. It has even been surmised that meddled with at one time, himself at the head of the rebels of Flanders. The soul of these intrigues as well as the protector of John's ambitious designs was his secretary, Juan de Escovedo, notwithstanding he had been appointed to that office by Philip for the express purpose of countering them. No sooner therefore had Escovedo arrived at court for the purpose of furthering his master's views, than Philip, who was already acquainted with the whole intrigue, decided upon his ruin; but unwilling, from the tranquillity of state, to violate the common forms of law, he committed to Perez the execution of his wishes. Accordingly, and in compliance with Philip's orders, Perez hired some assassins, who murdered Escovedo in March, 1578. A few months after the perpetration of this crime, Philip petracted at the time with Doña Ana de Mendoza, princess of Eboli, the supposed object of the king's affection; in all appearance to yield to the solicitations of Escovedo's relatives, and the threats of John of Austria, but in reality from other motives, which though was maimed at the time, and is satisfactorily known. In his Relaciones, published several years after the tragedy, Perez treated at length of all these events, but such was his dread of Philip that he always expresses himself in very ambiguous and equivocal terms, and the whole treatise is written in a veiled style. It has been supposed by some that Perez was imprudent enough to communicate his secret to the princess, whom he used to visit without the knowledge of his master, and to promess him her protection and favour; but that wily monarch reversed the con trust, and exerted his influence over the king's orders to that effect. Perez would undoubtedly have suffered capital punishment, had not his wife Doña Maria de Céroles, assisted by his friends, procured him the means of escaping from his prison, and taking refuge in England. On his return to Saragossa, Perez appeased, in virtue of the Aragonese laws, to the protection of the Justicia, and insisted upon a fair and open trial; but Philip, regardless of the authority of the Justicia, of the people's liberties, and his own oath, maintained them, commanded the entrance of Calatayud to seize the secretary and confine him in the royal prison. This arbitrary violation of their constitution the people of Saragossa rose in arms, and by force released the prisoner. A third and last expedition was then tried by Philip. After the king was known to be in correspondence with Catherine, the sister of Henri IV. of France, and a Protestant, he was accused of heresy and witchcraft, and lodged in the dungeons of the Inquisition. The patriotic Justitia protested against this new infraction of the people's privileges, and the inhabitants of Saragossa, infuriated by the last degree, invested the palace of the Inquisition and delivered the prisoner, after putting to death the Marquis de Almenara, Philip's representative, and committing other
excesses. No sooner did Philip hear of the revolt, than he ordered a considerable army to Aragon. The Saragossians rose in arms: a tumultuous body, headed by Don Martin de Lanuza, the Justiciar, went out to meet the royal troops, but having lacked foxed at the approach, the unfortunate nobleman was taken prisoner and immediately executed, the forms of liberty being thus for ever extinguished in Aragon. In the meanwhile Perez made his escape into France, where he published the narrative of his sufferings and found protection at the Court of England, was kindly received by Elizabeth's ministers, and other illustrious men of the time, such as the Earl of Essex, Lord Southampton, Francis and Anthony Bacon, &c., with whom he maintained a correspondence in Latin. He seems even to have entertained a certain preference for England, as appears by a letter written to James VI, and another addressed to him by Thomas Parry, which are preserved in the library of the British Museum among the Cotton MSS, Caligula, e. vii. During Perez's stay in France several unsuccessful attempts were made by Philip to have him assassinated. Estale (Journal de Henry IV, vol. ii., p. 253) says that a Spaniard, named Rodrigo Muri, was executed at Paris in 1596 for attempting to murder Perez, and that when he put to the rack, he confessed that he was sent by his citizen minister of Naples. Perez died, miserably poor, at Paris, on the 3rd November, 1616, and was buried in the monastery of the Celestins, where his tomb, bearing a Latin epitaph, was still to be seen shortly before the Revolution. Besides his Relaciones, which appeared in the first time as in 1598, and afterwards reprinted there in 1624, and at Geneve in 1631, 1644, and 1654, and his Cartas y Aforismos, published at Paris in 1603 and in 1605, besides other subsequent editions without date, Perez is said to have written a history of Philip II and the political works of that monarch, which is also the collection of letters by him addressed to the Connetable de Montmorceny, preserved in the royal library at Paris. Part of the former work was translated into French and also into Latin, with this title, Institutiones Imperiales, Amst., 1657.

(Watson's Philip III., vol. iii.; Ferreras, Synopsis Historiae, vol. x., part 16; Cabrera, Historia de Felipe II., Madrid, 1619; Vanderhammer, Historia de Don Felipe el Pescador, Granada, 1849; Nicolas Antonio, Bibl. Nova, tom. i.)

PERGAMOS, or PERGAMUM (Περγαμός, Περγάμος), the most important town in Mysia, is first mentioned in Xenophon's Anabasis (vii. 8, s. 8). It was strongly fortified by nature, and was chosen by Lysemanus as his most secure dominion in his province for depositing his treasures. He committed the charge of them to Philleterus, a native of the small town of Teum in Pontus (Strabo, xii. 345), who remained faithful to his charge for some time; but having, in c. 60, warmly treated Lysimachus, he declared himself independent about a.c. 283, and remained master of the town and a small part of the surrounding country till his death, a.c. 263. (Strabo, xii. 263.) He was succeeded by his nephew Eumenes, who increased his dominion to that of Alexandria. In consequence of the prolonged resistance of the inhabitants, the town was burned and the city destroyed by Alexander the Great. In consequence of the prohibition of the exportation of papyrus issued by Ptolemy, he is said to have invented parchment (Plin. Nat. hist., xiii. 21), but this material was probably known before his time. [Parchment.] The library remained at Pergamum till Antonius made a present of it to Cleopatra. (Plat. Inscr., c. 58.) Eumenes was distinguished, according to Polybius (xxvii. 23), by many eminent qualities, and left his kingdom in a very flourishing state. He died a.c. 159, after a reign of 39 years, leaving an infant son to the care of his brother Attalus II., who administered the affairs of the kingdom with great success for 21 years. Shortly after his death a c. 133, his kingdom became a Roman province under the name of Asia. (Strabo, xii. 624.)

The history of the kings of Pergamum is given in an Appendix to Clinton's Fasti Hellenici (vol. iii., pp. 408-410). Compare the article Attalos in this work.

Pergamum was situated north of the river Caicus (prifes or Bahr). The small river Selinus flowed through it. (Plin. Nat., xii. 233.) The city was strongly fortified, and was built on a hill of a conical shape. The town itself was very large, and possessed many public buildings of which the most celebrated was a temple of Aeolus, which possessed the right of asylum. (Tac. Ann., iii. 61; App. Mith., c. 69.) The church of the temple of Neptunus, to which St. John wrote in the book of the Revelation (v. 11; i. 12). It continued to be the capital of the Roman province of Asia. Pliny (Hist. Nat., v. 33) calls it by the most celebrated town in Asia (that is, the province of Asia). That same town, which is called Berora, at a still a place of considerable importance. Mr. Fellows, who visited it in 1838, says (Excursion in Asia Minor, p. 34) that it is as busily and thriving as heavy taxation will allow, and has even seven or eight khans. It contains many extensive ruins. Colonel Leake (Perseus, A Journal of an Expedition in Asia Minor, 266) that remains of the temple of Apollus, of the theatre, stadium, amphitheatre, and several other buildings are still to be seen. Mr. Fellows informs us (p. 34) that the houses are full of the relics of marbles, with ornaments of the richest Greek art. The name Pergamum signifies a 'hill' or 'elevated place,' and the word is used by Homer (II., iv. 508) to express the acropolis of Ilion. The relationship of the word Pergamum to the Greek word for 'abundance' is obvious. The names of the towns Berge in Thrace and Pergamum in Mysia contain the same element Berg. Compare also Herod. viii., 43. 112.

PERGE. [PAMPHYLIA]

PERGOLESI, GIOVANNI-BATTISTA, was born, according to Dr. Burney—who drew his information from persons well acquainted with the composer—at Canosa, near Naples, in 1704; Matti, says, at Pergola, in 1707. Sr. John Hawkins makes it 1718; though it is evident that at least this instance he was not so correct as usual. But in the Gazette Musicale, No. 49, it is stated that the Marchese di Villarric had (recently, we conclude) published a Lettura Biografica—concerning this very eminent Italian musician, in which he tells us, he possesses the superiority of a captious regulator, that he was born at Jesi, in 1710. Nevertheless the presumption is in favour of the English historian, as it is possible that the registration discovered by the marquis may have been that of a person of the same name. All agree, however, that Pergolesi was educated at the Neapolitan Conservatorio dei Poveri in Giano Cristina, under Gaetano Grisi and Durante, and that at the age of fourteen, fully par

* Strabo (xii. 624) says 49, but this must be a mistake. See acknowledgments, Ad Polya, xxiii. 22, and Clinton's Fasti Hellenici, vii. 63, p. 623.
suaded that melody and true taste were sacrificed to what was called learning, he was withdrawn, at his own request, from school, and immediately adopted the style of Vinci and Hasse. His first productions, among which was Metastasio's Olimpide, were coldly received, both at Naples and Rome, for his new manner was not understood. But through his friend Stigliano, discovering his merit, procured an engagement for him at the Teatro Nuovo. There his light but elegant intermezzi, La Serata Padrona, which afterwards made so enormous a stir in Paris, was his beginning.

Though the dramatic compositions of Pergolesi met with little success during his short life, his productions for the church were duly appreciated, and received with the applause they deserved. His fine mass in D, in which is the motet Sin illa voce, with general rapture, says Burney, at Rome; where also his grand motet, Dixit Dominus, and his Laudate, Pueri, were equally admired. At this time he began to show decided symptoms of pulmonary disease, and removed, for change of air, to Torre del Greco, at the foot of Vesuvius. Here he composed his lovely and most pathetic 'Stabat Mater,' a Catholic hymn; likewise the motet, 'Salve Regina,' his latest work. He died in 1736, at nearly the same period of life that bounded the earthly existence of Rossini, Handel, and the danger of the famous Rossini. But the Prince of the Indies's death during his lifetime, was now equally solici-
tous to do justice to the works and memory of their deceased countryman." (Hist. of Mus., 551.)

It is said that the poet first made Pergo-
lesi's works known in England. It is certain, that he con-
sidered them as models of perfection,—a fact mentioned to Dr. Burney by Walpole, Mason, and other friends of the great British poet. Pergolesi's opera, L'Olimpide, was first per-
fomed in London in 1734; and his 'Semiramide', in 1750. His sacred compositions were performed at the Academy of Ancient Music shortly after they reached this country, and have never since ceased to be admired by all true lovers and judges of the art.

PERI/BOLUS (Conology), a genus of Gastropods founded by Adams on young cowries, the outer lips of whose shells were trenchant and not yet come to their per-
manent form. (CYPRED.: vol. viii, p. 254, fig. a, &c.)

PERIBOLUS. (Sarc. binom.)

PERICARDIUM. (Heart).

PERICARDITIS. (Heart, Diseases of.)

PERICARP is strictly the shell of a seed-vessel, varying very much in texture, as between the grape, where it is feathery, the chestnut, where it is fibreous over tributaries, and the tanbark, where it is succulent externally and stony inside; but in these cases always originally the simple sides of a free carpel. In practice however the term pericarp is also applied to those seed-
vessels whose sides are formed of the floral envelopes and staminens in a state of adhesion to the carpel, as in the apple, gourd, &c. When the pericarp separates into distinct layers, those layers have sometimes separate names, as in the plum, whose outer skin is the epicarp, whose pulp or flesh is the sarcocarp, and whose stone is the endocarp, or testa. In such cases the endocarp answers to the upper epidermis and parenchyma of the carpellary leaf, the sarcocarp to the mesophyll, and the epicarp to the inferior epidermis.

PERICERIA. (Maiden, vol. xiv, p. 301.)

Pericles had a son named Phthippus, who defeated the Persians at Mycale, and of Agariste, niece of the famous Pericles, of whom a fine statue was put up at Athens in his memory. Pericles' account shows that he acquired from Anaxagoras moral as well as phy-
sical truths, and that while he learned enough of astronomy to raise him above vulgar errors, the same teacher supplied him with those notions of the orderly arrangement of society which were afterwards so much the object of his public life. But all these studies had a political end, and the same activity and acuteness which led him into metaphysical in-
quiries, gave him the will and the power to become ruler of Athens.

In his youth, old men traced a likeness to Pisistratus, which, joined to the obvious advantages with which he would have entered public life, excited distrust, and actually seems to have retarded his appearance on the stage of poli-
tics. However, about the year 465, two years after the os-
cermonies of Thebes, and about the same time as when Aristides died, Pericles came forward in a public capacity, and before long became head of a party opposed to that of Cimon the son of Miltiades.

Plutarch accuses Pericles of taking the democratic side because Cimon stood for that of the nobles. Opposi-
tion usually strengthens the hands of the executive, and is therefore unfavourable to public liberty; and the Persian war seems to have been emphatically so to Athens, as at its termination, she found herself under the guid-
ance of a statesman who perished through the character of the general than of the prime-minister. (Herren's Political Antiquities of Greece.) Cimon's character was in itself a guarantee against aggrandisement either on his own part or others; but we may perhaps give Pericles credit for seeing in him a powerful ally in less dangerous hands than Cimon's. Be this as it may, Pericles took the popular side, and as such became the opponent of Cimon.

About the time when Cimon was prosecuted and fined (before B.C. 461), Pericles began his first attack on the aris-
tocratic party, and the rule of the oligarchs. He, however, more especially under the name of Pericles, and of an advocate yet more powerful (the poet Ephesius), succeeded in depriving the Areopagus of its judicial power, except in certain inconsiderable cases. This did not prevent Cimon from giving him a further triumph (B.C. 461). From this time until Cimon's recall, which Mr. Thirlwall places, though doubtfully, in the year 453, we find Pericles acting as a military commander, and by his valour at Tanagra preventing that regret which otherwise would have fallen on the head of Athens. What caused him to bring about the recall of Cimon was doubtful; perhaps, as Mr. Thirlwall suggests, to strengthen himself against his most virulent opponents by conciliating the more moderate of them, such as their great leader him-
self.

Pericles, after the death of Cimon, Thucydides took his place, and for some time stood at the head of the stationary party. He was a better orator than Cimon, in fact more states-
man than warrior; but the influence of Pericles was irre-
sistible, and in his address to the people he showed how we may consider as the turning point of Pericles' power, and after which it was well nigh absolute.

We are unable to trace the exact steps by which Athens rose from the situation of chief among allies to that of mis-
taking and despotic power. Intercourse with Persia, aided in the change, and increased their contributions nearly one-third. His finishing blow to the independence of the allies was the conquest of Samos and Byzantium, a trans-
action belonging, rather to history than to the display in the courts. From this time till the beginning of the Peloponnesian war, Pericles appears engaged in peaceful pursuits. He constructed a third wall from Athens to the harbour of the Piraeus. He covered the Acropolis with magnificent build-
ings, and encouraged public taste by the support of all me-
thods. He was the architect of the most conspicuous and tural beauty. At Athens, as is usually the case, Poetry had the start of the kindred arts, but during the age of Pericles it attained to a greater height than had ever before been reached. The drama was then at perfection in the hands of Sophocles; and the education of the people, as the representations, Pericles nurtured their taste and increased his own popularity by thus throwing open the theatre to all. This precedent, whether made by Pericles or not, ul-
timately proved more ruinous to the state than any defeat.

It made the people a set of pleasure-takers, with all that restlessness in the pursuit of pleasure which usually belongs to the privileged few. Another innovation, of which Pericles is supposed to have been the author, was equally injurious in its consequences, that, namely, of paying the debts in the courts. At first the pay was only moderate, but it opened
as a premium on attendance at law suits, the causes became a mode of excitement for a people whose intellectual activity made them particularly eager for anything of the kind, and thence resulted that buoyant spirit which is so admirably ridiculed in the Wasp of Aristophanes. But we may well excuse mistakes of this kind, grounded probably on a false view of civil rights and duties, such as an Athenian, with the highest possible sense of the dignity of Athens, would be likely, on first coming into Pericles. Pericles had an honest and serious wish to establish such an empire for Athens as should enable her citizens to subsist entirely on the contributions of their dependent allies, and like a class of rulers, to direct and govern the whole of that empire, of which the means best fitted for physical labour were to be supplied by a less noble race.

Pericles was descended, as we have seen, by his mother's side, from the family of Clisthenes, and he was thus implicated, according to the religious notions of those times, in the dark and sinister family which is so admirably committed at the very altars in the Acropolis. (Thucy. i. 126; Herod., v. 70, &c.) The Lacedæmonians, before the actual commencement of the Peloponnesian war, urged on the Athenians the necessity of banishing the members of the family who had implicated this offence in their religion, which was only an indirect way of attacking Pericles and driving him into exile. The Athenians retorted by urging the Lacedæmonians to cleanse themselves from the guilt incurred by the death of Pentanes. (Pausan. ii.)

It was not the Peloponnesian war for two years. His policy was that of uncompromising although cautious resistance, and his great effort was to induce the Athenians to consider Attica, the light merely of a post, to be held or resigned as occasion required, not of hallowed ground, which was so dear to him that he was not willing to have it lost for any cause. In the speech which he made before the war was declared, as it is recorded by Thucydides, he impressed the Athenians with these opinions, presenting the superiority of their navy and the importance of avoiding conflicts in the field, which was so successful, could only bring temporary advantage—if the contrary, would be irretrievable.

At the end of the first campaign, Pericles delivered an oration upon those who had fallen in the war, as he had done upon those of the war at home. That speech (at least if Thucydides reported well) we learn what Pericles considered to be the character of a good citizen, and we see in what strong contrast he placed the Spartan to the Athenian method of bringing up his citizens. This is most remarkable of all the compositions of antiquity—the full transfusion of which into a modern language is an impossibility—exhibits a more complete view of the intellectual power and moral character of Pericles than all that the historians and biographers have said of him. The power of the great orator and statesman has embodied his lofty conceptions, is beauty chastened and elevated by a noble severity. Athens and Athenians are the objects which his ambition seeks to immortalise, and the whole world is the theatre without a triumphal arch. His speech teaches that life is a thing to be enjoyed; death a thing not to be feared.

The plague at Athens soon followed, and its debilitating effects made restraint less irksome to the people; but while they weakened their activities, it increased their impatience of the war. In spite of another harangue, in which he represented most forcibly how absurd it would be to allow circumstances like a plague to interfere with well-laid plans, he was brought to trial and fined, but his influence returned when the war began.

In the third year of the war, having lost his two legitimate sons, his sister, and many of his best friends, by the plague, he fell ill, and after a lingering sickness died. Some beautiful tales are told of his death-bed, tending to show that the calm foresight and humanity in which he was so remarkable in life, did not desert him in death. It is an interesting question, and one which continually presents itself to a student of history, how far those great men who always appear at important junctures for the assertion of some principle or the carrying out some great national object, are conscious of the work which is appointed for them to do. It would for instance be most instructive, could we now ascertain to what extent Pericles foresaw that suppose containing control of pericles' Small part only of which he lived to direct. Looking from a distance, we can see a kind of necessity imprinted on his actions, and think we trace their dependence on each other and the manner in which they harmonised. Athens was to be preserved by accretions of power, wealth, and civilization to maintain a distinct in which, he had been vanquished, the peculiar character of Spartan institutions might have irreparably blighted those germ of civilization, the fruit of which all succeeding generations have enjoyed. But how should this be? Her leader must have been a single person, for energetic unity of purpose was needed, such as no cluster of contemporaries or string of successive rulers could have been expected to show. That ruler must have governed according to the laws, for a tyrant would have been expelled by the sword of Sparta, and so many other things. The powers of the commonality, every day growing up into greater power. Moreover, without being given to change, he must have been prepared to modify existing institutions so as to suit the altered character of the times. He must have been above his age in matters of religious belief, and yet so Catholic a temper as to respect prejudices in which he had no share, for otherwise in so intolerant an age he would probably have incurred the fate of Anaxagoras, and destroyed his own political influence without making his country one with the wiser. He must have been a man of taste, or he would not have been able to go along with and direct that artistic skill which arose instantly on the abolition of those old religious notions forbidding any departure from traditional resemblances in the delineation of the features of gods and heroes, otherwise he would have had great hold upon the people of Athens. If Pericles had not possessed oratorical skill, he would never have won his way to popularity, and later in life he must have been able to direct an army, or the expedition to Samos might have been fatal to the policy of power which he had been so long in building. Lastly, had he not lived to strengthen the resolve of the warring people while the troops of Sparta were yearly ravaging the Thessalian plain, the Peloponnesian war would have remained, or by the reign of the commonality, every day growing up into greater power.

Pericles' connection with Aspasia can hardly be passed over without a trifling notice. Some misunderstanding exists on this subject from not taking into account the fact that Aspasia was a foreigner. She came, it is true, as an adventuress, and she is also probable that she was the cause of the separation of Pericles and his first wife, the soul of Hippocrates. He lived with her after disowning his wife, who consented to the separation, and he is said to have been strongly attached to her. The relation which subsisted between Pericles and Aspasia may have been of the same nature with the inorganic marriage at present in use on the Continent. * 

*What the jokes...
of Aristophanes as to the real origin of the Peloponnesian war had any foundation we cannot now tell. It is hardly probable that texts like that of Pindar IV. should have been a coarse and vulgar volupvity. [ASPARA] (Thucydides; Plutarch, Pericles; Thirlwall's History of Greece; Clinton's Fasti Hellenici.)

PERICRA/Nium, is the tough fibrous membrane which covers the bones of the skull, and bears the same relation to them which the peristome does to the bones of the rest of the skeleton. [BONE.]

PERIDOT. [CHRYSOLITH.] PERIGEE, the point of the moon's orbit in which she is nearest to the earth. [EARTH.]

PERIGORD, a province of France, one of those included in the great military government of Guienne. It was bounded on the north by Poitou (a portion of which was prolonged so as to meet the boundary), on the northeast by Limousin, on the southeast by Quercy, on the south by the Agenais, on the west by the Bordelais, and on the north-west by Saintonge and by Angoumois. Périgord was a compact district extending about 30 miles from north to south and about 46 miles from east to west, watered by the river Dordogne and its tributaries. It was subdivided into Haut or Upper Périgord, and Bas or Lower Périgord. These provinces were sometimes distinguished as Blânc Périgord and Noir Périgord. In the former were the towns of Bergerac, Philosophes, Luzech, 8758 whole commune; in the latter, 11,576, capital of all Périgord; Nontron (population in 1831, 2132 town, 3246 whole commune); Ribéac (population in 1831, 3924 commune); Bergerac (population in 1831, 5666 town, 8557 whole commune); Souillac (population in 1831, 3907 town, 3907 whole commune); and other places. In Lower Périgord the towns were, Sarlat (population in 1831, 3917 town, 6056 whole commune; in 1836, 6066 commune), Belvès, St. Cyrien, and others. Périgord is chiefly included in the department of Dordogne.

Périgord gets its name from its capital Périgueux, which has preserved, in an altered form, the name of the Petrocorii, the ancient Celtic inhabitants of the district. It subsequently was subject to the Goths, and then to the Franks, and finally to the Counts of Aquitaine. It is the chief seat of the great duchy of Aquitaine. Under the Carolingians, Périgord became a county, which came in the tenth century to the counts of Marche.

In consequence of a dispute with the inhabitants of Périgouex, the county of Périgord was declared to be forfeited to the crown, and bestowed on Louis duke of Orleans (A.D. 1239): it afterwards passed by sale to the family of Blois, counts of Penthièvre, and by subsequent changes became part of the county of the earls of Marche of the ancient throne (A.D. 1589) it was united to the crown. A branch of the house of the counts of Marche and Périgord became lords of Grignols and princes of Chalais and Talleyrand: the late prince Talleyrand was a descendant of this stock.

Perigord is the name of the department of Dordogne, situated on the Isle, a feeder of the Dordogne, 262 miles in a direct line west-south-west of Paris, or 294 miles by the road from Paris through Orleans and Limoges to Bordeaux. It was known to the Romans by the name of Vouuna, capital of the Petrocorii, a Celtic nation, and, in common with the other Gallic capitals, assumed, near the close of the Roman period, the name of the people to which it belonged, Petrocorii, from which is derived the modern Périgueux. The town is said of the name of Apollon, is still designated Vaison, an evident modification of the original name, and the suburb in which it stands retains the designation of La Cité. This town is round, about 200 feet in circumference, with a wall 6 feet thick and 6 feet high composed of square stones, and faced on the inside with a layer of brick and mortar: it has neither doors nor windows, and is supposed to have been built for a sepulchre. There are some few ruins of an amphitheatre, the greater diameter of which is estimated to have been 274 feet and nearly 290 English feet, of aqueducts, and of public baths. There are also some remains of the town wall, which now enclose some gardens and vineyards, and show by their construction and materials that they had been hastily built up after some disaster. There is a Roman gate, a bridge, and remains of a Roman camp. Périgous passed from the hands of the Romans into those of the Goths, and subsequently of the Franks. It was at an early period the seat of a bishopric.

In the middle ages it was an object of contest to the French and the English (who were then masters of Guienne); and in later times it was the scene of protest of Condé in the civil troubles of the minority of Louis XIV., and taken by the townspeople, who were chiefly of the opposite party.

The town lies chiefly to the left of the road to Bordeaux, which just runs through the outskirts; and to a traveller glancing at it on that side presents an appearance to which the dark, narrow, crooked streets of the interior do not correspond.

The houses are, however, well built, mostly of freestone, and very lofty; and there are some agreeable public walks.

The cathedral of Périgueux is the most magnificent building of a town about 193 feet high: in a chapel of this cathedral is a fine carving in wood of the Annunciation, a work of immense labour and exquisite finish. The office of the prefecture is the finest building in the city. The town-hall is in the extreme south of the city, a large and fine palace. The population of Périgueux in 1831 was 8790 for the town, or 8926 for the whole commune; and in 1836 it was 11,576. The inhabitants manufacture light woollen goods, hosiers, felt and straw hats, leather gloves, braid, and paper; they carry on trade in iron-ware, grocery, liquors, pugs, pottery, game, especially partridges, turkeys, which are gathered in the surrounding district, and truffles. Wax-bleaching is carried on. There are four yearly fairs. There are a college or high school, with a collection of rare manuscripts; a library of 16,000 volumes; a museum of natural history and antiquities; a botanical garden, and an agricultural society; also an hospital, a theatre, and public baths.

The diocese of Périgueux comprehends the department of Dordogne, and is a suffragan of the archbishop of Bordeaux. The arrondissement is divided into nine cantons or districts, each under a justice of the peace, and comprises 116 communes. The population in 1831 was 12,872.

PERIGIEUION, the point of the earth's orbit in which it is nearest to the sun. [APHELION.]

PERILLUS. [PHALAMIS.]

PERIMETER, the circuit, or bounding lines, of a plane figure: a term usually applied to rectilinear figures only, but without any necessary restriction to those.

PERIOD, a name given to the recurring part of a Cinulating Decimal.

PERIODIC FUNCTIONS. The general consideration of periodic magnitude, that is, of magnitude which varies in such manner as to go through stated cycles of change, each cycle being a reiteration of the preceding one, is the subject of Trigonometry. Though that science derives its name from the measurement of triangles (as geometry does from the study of the circle), it is largely a study of algebra, and its methods extended until no definition short of the preceding will express its object or convey an idea of its powers. In the article cited will therefore be explained the mode of measurement applied to periodic magnitude: the term to be employed must be the variable, peculiar in some cases to kinds of algebraic functions which has procured for them the name of periodic functions.

The calculus of Functions considers only forms, and the operations necessary to convert one given form into another, or to satisfy equations in which some forms of operations are unknown. Periodic functions are those which, performed any given number of times on a variable, reproduce the same variable itself. Thus  1 - x  and  - x are periodic functions of x, since

Again, 1:  (1 - x) is a periodic function of the third order, since, if we begin with x, and write 1: (1 - x) for x three times in succession, we end with x also:

   x
   1 - x
   2 - x
   x

Periodic functions are remarkable in the calculus of functions for the simplicity with which questions connected with them can be solved, when compared with the difficulty of solution of cases in which non-periodic functions enter. Their principal properties are here briefly pointed out: for further information, consult Babbage's 'Examples of Functional Equations' applied to Periodic Functions,' an article on the Calculus of Functions contained in the 'Encyclopedia Metropolitana,' where further references will be found.

Let \( \phi \) be a function of \( x \); abbreviate \( \phi(x) \) into \( \phi \).
PERIODS OF REVOLUTION. In the present article we simply describe the names, commencements, lengths, and uses of those periods which it is most requisite the reader should find distinctly explained in a work of reference, premising some explanation of the way in which comparison of different periods gives new periods.

By a period we mean a definite portion of time, beginning from a given epoch, which being repeated again and again, will serve to divide all time subsequent to the epoch (or precedent, if the repetitions be also carried backwards from the epoch) into equal parts, for the purposes of common reasoning and historical chronology. A period is then a finite portion of time used for measurement, just as a foot or mile is used for measurement of length.

Periods may be divided into natural and artificial; the former immediately suggested by some recurrence of astronomical phenomena; the latter arbitrarily chosen. Since however time cannot be preserved and handed down as it were material, it is natural that the knowledge of artificial periods should be preserved by representing the number of natural periods which they contain; nor is it to be supposed that artificial periods were ever invented in a perfectly arbitrary manner, or were indeed ever anything more than convenient collections of natural periods.

When the period is contained an exact number of times in another, each commencement of the larger one is also a commencement of the smaller one; thus the day being exactly twenty-fourths, if any one day begin at the beginning of an hour, all days will do the same. But if the smaller period be not a measure of the larger, a longer period must be imagined, which in this article we will call a cycle, consisting of the interval between the two nearest moments at which the smaller and larger periods begin together. This week, consisting of seven days and a month of thirty days gives a cycle of seven months or thirty weeks, these two periods being equal. If however the two periods can be measured by a larger number of days, the cycle may be made smaller: thus, a month of 30 days and a year of 365 days, or a month of 6 times five days, and a year of 73 times five days, would give a cycle of 6 x 73 times five days, that is of 6 or 73 months.

When two natural periods are expressed by complicated fractions of days, the method explained in PRAXIS, CONTINUA, will be to show nearly how many of one period make up an exact number of the other. Thus the tropical, or common, year being 365.24224 days, and the lunation being 29.53059 days, both approximate, it appears that 365.24224 / 29.53059 lunar months would be 2,933,059 years nearly. To reduce the lunation year of others more than 73 times five days, would be accurate as the number of figures employed will permit, preceded as in the article cited with the fraction.

2,933,059
365,242,242

The quotients obtained are 12, 2, 1, 2, 1, 17, &c., at which we stop, because the appearance of so large a quotient as 17, shows that the result of the preceding quotient is extremely near. The successive approximations derived from the first six quotients are:

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<tr>
<td>12</td>
<td>25</td>
<td>37</td>
<td>99</td>
<td>136</td>
<td>235</td>
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Or 233 lunations make 19 years very nearly.

The period in which all others are expressed is the day, which is not, as many suppose, the simple time of revolution of the earth, but [Day] the average time between noon and noon. To distinguish it from other days it is called the mean solar day.

The year, or the time between two vernal equinoxes, is not a uniform period, nor does the average of one law period give precisely the same as another. [V. i. a.] For chronological purposes however it is useless to take account of this variation, and 365.2422414 days, the year of astronomers in our day, may be considered as more than sufficiently exact for any time. In fact the year is made to consist in the long run, of 365.242245 days, and a cycle of 400 years is necessary to the complete explanation of this fraction. Supposing the years from a.D. 2001 to a.D. 2400, both inclusive, each fourth year is leap-year, beginning with 2004, except only 2100, 2200, and 2300, which gives in the 400 years 365 days to each year, and 97 intercalated days; while if this number be raised to 97 days to 400 years, adds on the average 97.4006666 days to 2425 of a day, to each year. As it is of considerable in
portance distinctly to comprehend an intercalated cycle, that is, one in which fractions are disregarded until they amount to a unit, when they are corrected, to use a common phrase, in the lump, we put down the effect of the correction which is made in this year (1846) by a leap-year. In 1836, immediately after the last intercalation was made, the sun was in the vernal equinox at about 39 minutes after one P.M. on the 29th of March, and the equinoxes then took place as follows:—

1836 Sun in equinox at 1h 39m P.M. March 20
1837 " " 1h 37m " March 20
1838 " 1h 35m " March 21
1839 " 1h 33m 1 M.A.D. March 21
1840 " 1h 31m 1 P.M. March 20

The intercalation of the present year (but for which the sun would have come on the equinox at 41 minutes past noon on the twenty-third) has undone the correction, bringing the equinox nearer to noon than in 1836 by 59 minutes. Now, this over-correction of nearly an hour in four years is set right by leaving out the correction three times in four years; a provision, the necessity of which may be imagined, though its exactness cannot be appreciated from the preceding calculation.

The Gregorian year, therefore (or the year in the Gregorian reformation of the calendar), is a portion of a cycle of 400 years of 365 days, 97 of which have an additional day. [KALENDAR.] The Julian year, in use before the Gregorian reformation, is a portion of a cycle of 4 years, being one of which has an additional day. Without a perfect comprehension of the manner in which the incommensurability of the year and day is remedied, no progress can be made in the understanding of the nature and use of chronological periods.

An Era means either the commencement of an indefinite reckoning, or of a succession of periods. In the article Era will be found the complete description of the most important eras; but as it often happens that for reference the mere name of such eras is wanted without explanation, we subjoin an extensive list, merely giving the leading words, and the date a.d. or b.c. of the vulgar Christian era. It is to be remembered that the birth of Jesus Christ has taken place in the fourth year b.c. of this common era. The figures following the years refer to months and days: thus A.D. 729.6.13 would stand for* the 13th day of June, A.D. 729. We do not mean to say that the events in the following list did take place in the years, for the months, or the days, which are set down: but only that those who used them as eras, took them as having happened in those years, months, and days. Thus the death of Alexander, according to Clinton, took place in B.C. 323, which is most likely to be right; but if those who made an era of this death, reckoned from the 12th of November B.C. 324, that day is the era, whether the event happened then or not.

Mundane era of Constantine b.c. 5508.3.21 (or 4.1.1)
Civil era of Constantine b.c. 5508.9.1
Mundane era of Alexandria b.c. 5502.8.29
Mundane era of Antioch b.c. 5492.9.1
Commencement of Julian period a.d. 4713.1.1
Common mundane era (Abp. Usher) a.d. 4004
Mundane era of the Jews b.c. 3761 (vernal equinox)

Civil Jewish era b.c. 3761.10.1
Caligula (Hindu) b.c. 3101
Era of Abraham (Eusebius) b.c. 2015.10.1
Olympiads b.c. 776.7.1
Building of Rome (Varro) b.c. 754.4.21
Building of Rome (Cat.) b.c. 752.4.21
Era of Nabonassar (Babylonian) b.c. 747.2.25

Metonic cycle b.c. 432.7.15
Calippic period b.c. 330
Julian reformation a.d. 45
Death of Alexander b.c. 324.11.12
Era of the Seleucidae b.c. 312.9.1
Era of Tyre b.c. 123.10.19
Era of Vercingetorix (Hindu) b.c. 57

There are some incorrectness, but great convenience in this. Astroномуs now sometimes use such a notation as 1824 G.1, not to denote 1824 years and 61,100ths of a year, but the moment at which 61,100ths of the 1846th year have elapsed.

P. C., No. 1095.

Cæsarea era of Antioch b.c. 49
Greek era of 49
Syracuse era of 48

Spanish era b.c. 36.1.1
Era of Actium b.c. 30.1.1
First leap-year of the Augustan reformation a.d. 8
Era of the Ascension (as used in the Chronicle of Alexandria) a.d. 38
Era of Salavius (Hindu) a.d. 17
Era of Dioscorus, of Martyria b.c. 284.9.17
Indiction of Constantine b.c. 312.9.1
Era of the Armenians a.d. 552.7.9
Hegira a.d. 622.7.16
Era of Yazdigird a.d. 632.6.16
Greek Gregorian reformation, or new style a.d. 1582
English adoption of the Gregorian reformation a.d. 1752

Among the various sources of confusion may be noticed :
1. an old practice of astronomers in the year immediately preceding and the vulgar era, not 1 but 0; the discrepancies arising from different times of beginning the year. The most important of these to the English reader is the following:—Before the change of style in 1752, and from the fourth to the ninth century to that time, the legal and ecclesiastical year began on the 25th of March, though it was very common in writings, &c., to begin it on the 1st of January. Hence January, February, and twenty-four days of March, were in one year, according to lawyers, &c.; and in another according to others. Thus the Revolution, so called, of 1688, took place in the February of that legal year, or, as we should now say, February, 1689. It is frequently written thus: February, 1652, or February, 1689-9. Thus, King Charles was beheaded January 30, 1644, or January 30, 1645.

We now come to the artificial periods which are of most use in chronological researches: these are—
1. The cycle of the sun, or more properly the cycle of the Sun's orbit.
2. The cycle of the moon, or of nineteen years, or of the Golden number, or of the Primes, or the Solar cycle with its era altered. [METON.] 3. The cycle of indictions.
4. The Pashcal cycle.
5. The Julian period.
6. The cycle of the sun is a period of 26 years, composed of 7 and 4, the number of days in a week, and the number of years in the interval of two leap-years. This, in old style, makes the Sundays return to the first day of the year; every year of the cycle being in this respect exactly the same as the year preceding it. Thus, the year a.d. 1 being the tenth in its solar cycle, and the DOMINICAL LETTER being for that year b, or the 2nd of January being Sunday, the 2nd of January was also Sunday in the year a.d. (1+29), or a.d. 28, also in a.d. (29+28), or a.d. 57.

The series of domical letters for the complete solar cycle is as follows,—attached to each domical letter is what was called the concurrent of the year, meaning the number of days elapsed over and above a complete number of weeks, from the beginning of the cycle (not including the first day) to that day of the year in question, the concurrent being written 7 where 0 would perhaps have been better.

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Connected with this table is one of what were called solar regulae (regulae) which should have been the modern term, one for each month, as follows:

Jan. 2 | Feb. 3 | Mar. 5 | Apr. 1 | May 3 | Jun. 6 | July 1 Oct. 2 | Nov. 5 | Dec. 7 |

The table given in DOMINICAL LETTER would save some of the following process, which however it is better to give.

Old Style.—To find the part of the solar cycle in which any given year is found. If the year be A.D. 9, add 9 and find the number of days it is from the 1st day of the year in the above table. Then find the letter which is in that number, and that letter is the dominical letter for that year, and the number of days from the 1st day of the year to the letter is the concurrent of the year.
divide by 28; the remainder (or 28 if the remainder be 0) is the year of the solar cycle required. But for a year a.d., deduct 10 from the date, and divide by 29; the remainder deducted from 26 gives the year. The dominical letter and concurrence are then taken from the preceding table. And to find on what day of the week the first day of any month fell, to the concurrence of the year add the regular of the month, the sum (diminished by 7, if it can be done) shows the day, 1 being Sunday, 2 Monday, &c. (The day later must be taken for every month after February.) Thus to find the day on which the sun of the Hegira fell, or July 16, 622 A.D., 622 9 or 631 divided by 28 gives the remainder 13, which is the year of the cycle. The concurrence is added in the month of July, 1 gives 5, or Thursday for the 1st July, and Friday for the 16th: whence Friday is the day required.

The perpetuity of the solar cycle, in the connection of its numbers with the dominical letters, &c. is, destroyed by the cycle of 28 years, in which a similar cycle of 28 years exists. Up to the end of this century however, the cycle of 28 years, as it now exists, will remain undisturbed,* and it may therefore be worth while to give the years of the solar cycle answering to the decades of the century, and the table of dominical letters, concurrences, and regular:—

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*Since A.D. 1500 is not leap year, the whole cycle will then be observed, but since I900 is leap year, it may be reconstructed so as to last till 2000. The new style in which this cycle of 28 years is used is called by the Hebrews '531 of 28 years, the latter number being the last possible day of a full moon that was following the 19th of May may be Easter Sunday, and is given with their dominical letters:*
here to do with is the fact, that from Athanasius downwards, they were more or less employed by ecclesiastical writers in describing epochs. The popes afterwards adopted this mode of dating, and the common Indiction found in chronological tables begins so that a.D. 317 is the first year of the first cycle of Indiction, each cycle containing 15 years. At this rate a.D. 1 was the fourth year of an imaginary preceding induction, and the remainder of more than the date of any year divided by 15 will give its position in its Cycle of Indiction. Thus 1239, increased by 3 and divided by 15, gives the remainder 12, or a.D. 1239 is the twelfth year of a cycle of Indiction.

4. The paschal cycle is one compounded of 28 and 19 years, or 52 years, during which time the ephemeris of the sun of 19 years have their combinations and recommend them again. According to the old system then, this is the cycle of Easter Days, which begin again in the same order when it is finished. a.D. 1 was the second year of the first paschal cycle, being also 2 of the cycle of 19 years, and 10 of its solar cycle. The paschal cycle of the Gregorian calendar would be 53,200 years.

5. The Julian period was imagined by Julius Scaliger, and is a combination of the solar cycle, the cycle of 19 years, and that of Indictions. Now 28 rotations of 19 gives 528 years, which is the length of the period in question. It was made to begin at a year n.c., which was the first year of each cycle, namely n.c. 4713 years. Hence, subtract any year n.c. from 4714, or add any year a.D. to 4713, and you have the year of the Julian period. The advantage (if it be one) of this period is, that by dividing the year in it by 28, 19, and 15, the remainders show the years of the different cycles belonging to the Julian date used, remembering when the remainder is nothing to substitute the divisor instead.

Astronomical periods actually existing in nature, may be divided into—day, month, connected with the rotations of the planets round their primaries—years, connected with the rotations of primary planets round the sun—and secular periods, connected with slow changes of the elements of orbits. The most convenient period of measurement is the civil or mean solar day at the earth, being the average interval between noon and noon. [SYNOXY REVOLUTION]

This period being divided into hours, &c., the actual rotation of the earth is 23h. 56m. 4s. 09, and is called its sidereal period. The average rotation of the moon over the meridian is 24h. 50m. 38s., which might be called the mean tide-day. The rotation of the moon is the time of her revolution round the earth [Moon]: and the rotations of the planets are as follows (in sidereal time, so as to make 24 the rotation of the earth)—

| Sun | 23 | 12 | Mars | 24 | 29/4 |
| Mercury | 24 | 5/4 | Jupiter | 9 | 56 |
| Venus | 23 | 21 | Saturn | 10 | 29/4 |
| Earth | 24 | | Uranus unknown. |

Various months are described in the article Moon, the only ones here necessary to cite being the one already used, of 29d. 124m. 44s. 20, or 29d. 330395, the average interval from new moon to new moon, and 27d. 26h. 4m. 11s. or 27d. 22h. 21m. 15s., the actual time of revolution of the moon in the heavens. The satellites of Jupiter, Saturn, and Uranus have revolutions round their primaries as follows:

| Jupiter’s First S. | 1 | 18 | 28 | or | 17961 |
| Second S. | 3 | 13 | 14 | 8 | 2316 |
| Third S. | 7 | 3 | 43 | 5 | 96 |
| Fourth S. | 16 | 16 | 32 | 168988 |
| Saturn’s Ring | 0 | 10 | 29 | 0 | 370 |
| First S. | 0 | 23 | 28 | 0 | 84927 |
| Second S. | 1 | 8 | 53 | 1 | 3702 |
| Third S. | 2 | 1 | 18 | 1 | 8878 |
| Fourth S. | 2 | 17 | 40 | 10 | 3673 |
| Fifth S. | 4 | 12 | 25 | 4 | 1575 |
| Sixth S. | 15 | 22 | 41 | 15 | 9543 |
| Seventh S. | 7 | 9 | 55 | 79 | 3292 |

* The first indiction of Constantine is variously stated to have been a.D. 312, 313, 314, and 315.
Uranus's First S. 8 21 23 28926
Second S. 8 16 59 87068
Third S. 10 23 4 109611
Fourth S. 10 13 56 134559
Fifth S. 38 1 48 309750
Sixth S. 10 16 40 1076944

The civil year is the tropical year, the time of revolution of the sun from the vernal equinox to the same again. Owing to the motion of the equinox [Parensis], this year, or $365\frac{1}{4}$ days, or $365\frac{1}{4}$ days, is shorter than the actual revolution of the earth round the sun, which is $365\frac{1}{4}$ days, or $365\frac{26}{4}$ days. If the sun were the same distance from the earth, the sun's revolution from the earth's vernal equino from the earth to the same again, is $365\frac{1}{4}$ days, or $365\frac{26}{4}$ days.

Pericles, the efficient, and the final; the first being that of which things are made, the second that by which they are what they are, the third that by the agency of which anything is produced, and the cause of the existence of things. It is provided for the existence of substances generally, Aristotle divides them into three classes: the eternal, as the heaven, the perishable, as the bodies of animals; and the intermediate nature, or prime mover, as it were otherwise called, that occupies the place of God in his systems, was considered to be an eternal, incorporeal, and simple intelligence, and the original source of all motion, being itself unmoved. It's agency extended directly to the first celestial spheres, and mediately to the intelligences of lower spheres, and by them to the universe at large. The mode in which it operated to the production of motion seems to have resembled that by which the relations of the human soul give rise to muscular action.

Of secular periods, the most important are, the revolution of the moon's node, in 18 years; of the earth's perihelion, from the vernal equinox to the vernal equinox again (the latter also moving), or 21,600 years, the time of the revolution of the earth's axes, in 25,960 years.

PERIOTEUM, an old astronomical term for those who have the same latitude, but opposite longitudes.

PERIOMETREUM, [Bone].

PERIOTONICUM, Mr. Gray's name for the ephemeris of shells. [Shell.]

PERIPATETICS (περιπατηται) is the name given to an ancient philosophical sect. It was so designated from the circumstance of its founder, Aristotle, being accustomed to deliver his doctrines while walking in the grove of the Lyceum in the suburbs of Athens. [For an account of the life and works of this philosopher, see Aristotel.] There is scarcely any department of human knowledge of which the writings of Aristotle do not treat. It would far exceed the limits of this article to give a full detail of his opinions. Such of them only as characterised the school which he originated can be referred to, and even these must be briefly noticed. They have relation chiefly to his general physical and metaphysical principles. To his system of logic, with the additions subsequently made by his successors, it is unnecessary particularly to advert. [Organon.]

From the obscurity which attaches to the writings of Aristot., occasioned by the errors which have crept into them, the abstruseness of the topics and the obscurity of his style, it is somewhat difficult to ascertain with precision what his opinions really were. Previous to his time it was commonly supposed by those who had speculated respecting the origin of the universe, that there was an eternal substance from which bodies are made, and on which forms are impressed, and to which the name of matter was assigned. This matter was understood to have been always in motion, to consist of indefinitely small particles, and to have been collected and united in bodies by the agency of an invisible power. It was fuelled supposed that the original particles had certain properties by which they differed from each other, and by which the constitution of the bodies which they composed was determined. Empedocles and others taught that there are four primary elements, with their characteristic forms; and in the ages and the philosophers maintained that bodies exactly represent the form of each of their constituent particles; while Plato held that essential forms have an actual existence in the divinity, and that by the union of those with matter the formation of bodies is effected.

Rejecting all these theories, Aristotle assumed the undivided and independent existence of two opposite principles. But since such principles by their contrary would destroy each other, the existence of a third is requisite. These he conceived to be matter, form, and privation, the first two being the constituent principles of things, and the last being accidentally connected with them. The first matter was imagined to be entirely destitute of all qualities, to exist potentially, and to be the subject in which forms are made or impressed. Form he explained by the cause of that which constitutes it what it is. How the first matter and form were brought into union so as to produce beings does not appear; unless nature, the meaning of which is employed by Aristotle, is not easy to appreciated, account is impossible.

Aristotle distinguished causes into the material, the form, the efficient, and the final; the first being that of which things are made, the second that by which they are what they are, the third that by the agency of which anything is produced, and the cause of the existence of things generally. It is provided for the existence of substances generally, Aristotle divides them into three classes: the eternal, as the heaven, the perishable, as the bodies of animals; and the intermediate nature, or prime mover, as it were otherwise called, that occupies the place of God in his systems, was considered to be an eternal, incorporeal, and simple intelligence, and the original source of all motion, being itself unmoved. It's agency extended directly to the first celestial spheres, and mediately to the intelligences of lower spheres, and by them to the universe at large. The mode in which it operated to the production of motion seems to have resembled that by which the relations of the human soul give rise to muscular action.

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Such is an imperfect sketch of Aristotle's general doctrines of physics. His opinions respecting man may be shortly thus stated: Man is formed to be a social animal; he was designed for society; and society is necessary for his happiness. He is thought to be identical, giving them the common designation of entelechias (ἔντελεχια), or perfect energy. The faculties of the soul he considered to be, the nutritive, by which life is produced and preserved; the sensitive, by which we perceive and feel; and the rational, by which we understand. The sensitive faculty takes cognizance of external objects by means of its organs, which are employed to produce the various sensations of sight, hearing, &c. The senses receive forms or sensible species in the same manner as the imagination, by an impression which results from the immediate operation of the senses; while memory is derived from fancy, and is the effect of images formed in the soul by the senses. The intellectual or rational faculty is of a kind, essentially active, as in the intellect of a person, the seat of the powers of the soul, is the seat of species. Active intellect is either simple or complex: simple when it engages in the close apprehension of its object; complex when it combines simple concepts as so as to engender belief. Actual activity is inherent when it engenders what is simply true or false, and practical when it determines what is good or evil, and thus gives rise to volitions.

Whether Aristotle believed in the immortality of the soul, or not, he was not at all disposed to assent to it. He seems to have held that the soul is a power externally transmitted into the body, it has been inferred that he held it to be mortal, and that it ceased to have a separate existence after the dissolution of the body.

Aristotle's residence in the Lyceum was continued for about twelve years. In consequence of the hostility of his enemies, who accused him of propagating impious tenets, he retired, soon after the death of Alexander, to Chalcis, where he died. Before withdrawing from his public labours he had been appointed philosophus. He was succeeded in the chair. The opinion of the philosophers differed in some respects from those of Aristotle, but he was taught with much success, and was attended by about two thousand scholars. He was followed successively by Strato of Lampæsus, Lycon, and Geryon of Tarsus, Aristarchus of Ascalon, and Critolaus the Lycean. With Diodorus of Tyre, who came immediately after Critolaus, the unopposed success
cession of the Peripatetic school terminated, about the hundred and fortieth Olympiad. Among the early followers of the Stagirite, who did not fill the chair, were several eminent philosophers. The most distinguished of these were Democritus, a Messenian, Eudemos of Rhodes, and Demetrius Phalereus.

These schools were introduced into Rome in common with the other branches of the Greek philosophy by the embassy of Critolaus, Carneades, and Diogenes, but were little known till the time of Sulla. Tyrrannion, an eminent grammarians, and Andronicus Rhodos, were the first to introduce them. The early relations of Aristotle’s physics into notice. The obscurity of Aristotle’s writings tended much to hinder the success of his philosophy, but it nevertheless soon gained a considerable number of supporters. During the reign of the Caesars, it acquired still greater influence; and till the time of Ammonius, the preceptor of Plutarch, was taught with great purity. After that it was divided into two sects, consisting respectively of those who wished to adhere strictly to Aristotle, and those who were disposed to amalgamate his doctrines with those of other schools. Julius Caesar and Augustus patronized the Peripatetic philosophy. Under Tiberius, Caligula, and Claudius, its adherents, in common with those of other sects, were either banished or obliged to remain silent on the subject of their peculiar views. The philosophy was patronized for a time by the reign of the Nero, although during the early part of it philosophy was favoured. The chief Peripatetics in the first century of the Roman empire were Sozigenes of Egypt, who wrote a commentary on the Analytics of Aristotle; and Strabo Symmachus, who is mentioned by Strabo as having been his fellow-student in the Aristotelian philosophy, and Nicolaus of Damascus in Syria.

Ammonius the Peripatetic made great exertions to extirpate the authority of Aristotle; but after his time the Platonists began to study his writings, and prepared the way for the establishment of the Elecphatic Peripatetics under Ammonius Sacca, who flourished about a century subsequent to Ammonius the Peripatetic. Even after this period, however, the majority still adhered to Aristotle. The most celebrated of these was Alexander of Aphrodisias, who was a public professor of the Peripatetic philosophy, under Septimus Severus, in Alexandria or in Athens. Many of the Elecphatic Aristotelians wrote commentaries on his works, some of which are still extant. The principal of these writers were Theumistas, who flourished during the reigns of Constantius and Theodosius the Great; Olympioborus, who lived a century later; and Simplicius, who flourished at the close of theJustinianic epoch.

After this period, philosophy in general languished. But in that mixture of antient opinions with theological dogmas which constituted the philosophy of the middle age, the system of Aristotle undoubtedly predominated. About the twelfth century, it was transferred to the schools under the influence of the Jews, particularly in Spain; and at the same period also it began to be diligently studied, though not without much opposition, among the ecclesiastics of the Christian church. Out of this latter circumstance gradually arose the Scholastic philosophy, which took its tone and complexion from the writings of Aristotle, and which continued long to perplex the minds of men with its frivolous though subtle speculations. The authority of Aristotle received a severe shock at the Reformation, but it survived the fall of the Scholastic system undoubtedly predominated. About the twelfth century, a system of scholastic philosophy was patronised by the Roman Catholic church, on account of their supposed favourable bearing on certain doctrines of faith; and although Luther and others of the Reformers determinedly opposed them, they were maintained by them up to the time they were condemned on certain portions of the works of the Stagirite. Many individuals distinguished for their genius and learning exerted themselves to revive the Peripatetic philosophy in its primitive purity, nor did it cease to have many adherents among the great and learned men of the age, such as Gratius, and Des Cartes. (Aristot. Phys. De Coelo. De Gen. et Corr. De Anim. Diog. Laertius. Fabric. Bibl. Graec. Cudworth’s Intell. Syst. Brucker. Hist. Phil. Periphy, the Greek word for circumstance; a term that is still used in modern medicine.)

Peripneumony. [Lung diseases of.]

Periphr. or Periphot. [Temples.]

Periscii (those shadows move round). In these latitudes which are high enough to have the sun for twenty-four hours together, the shadows make complete revolutions, whereas the insulators may be called Perseus (Hippomenes). Peristerina. [Column. Vol. vii. p. 574.]

Peristoiomans, Lamarche’s name for a family of fluvialite specular Trachelipoda (Gastropods of Cuvier and naturalists who consisiting of the genera Valvata, Pulmonata, and Pulmonaria).

M. Deshayes (last. ed. of Lamarche) observes that though founded on natural characters, the family of Peristomians has not been adopted by the majority of authors. Cuvier, however, remarks in the first edition of the ‘Régne Animal,’ to his great genus Turbo; and though he recognized the analogy of the Ammonia. with the Pulmonaria, he did not lose his place in his genus Conchylium’ near the Phasianidae. M. Deshayes then concludes that Cuvier’s work is an imitator of Cuvier in the classification of shelled, has imitated him here; and M. de Blainville himself, resorting on anatomical observations, differs but little, in his ‘Treatise on Malacology,’ from the opinion of the latter. Nevertheless if we turn to the works of M. de Blainville, we say the subject of the Ammonarii and the Pulmonaria in the ‘Dictionnaire des Sciences Naturelles,’ we shall there find his opinions opposed to his classification. M. de Blainville in fact, who had made a dissection of Ammonia, finds the greatest difficulty in recognizing the affinity of the genera of the Turbo, whilst of the Ammonia, in the gener of Pulmonaria. If then classifications are intended to approximate forms which resemble each other, why place the Ammonia, and the Pulmonaria in two distinct families?

In the second edition of his ‘Régne Animal,’ Cuvier has more nearly approximated the three genera of the family of the Peristomians, comprehending all three in his Trochoïd Pectinibranchia. Since the anatomical work on the Ammonia, by M. de Blainville, M. Quoy, in the zoology of the ‘Voyage de la Resolution,’ has described the animals on a large species, and we can now compare the organization of the Ammonia, with that of the Pulmonaria, on whose anatomy Cuvier published a memoir.

M. Deshayes then goes on to state that he has himself been able to a certain extent to confirm those results already known some interesting facts on the organization of the Ammonia, If, says he, we consider the shells and the opercula which close them, we find an indiscernible analogy between them, an analogy so great in some species that it is impossible to distinguish to which of the two genera they ought to belong. The affinities (rapports) of the Ammonia, and Pulmonaria are then, in the opinion of M. Deshayes, incontestably established; and these affinities, he adds, are so numerous, that it seems impossible to distinguish them from each other. Furthermore, he also, thinks very great affinities with the Pulmonaria, from which they are nevertheless distinguished by the manner in which the animal carries its branchia.

If, says M. Deshayes, in concluding his observations on this family, the affinities which he has thus established are confirmed since the works of Lamarche, have confirmed his family of Peristomians, it remains to be ascertained whether the family itself should not change its situation. It is evident that the gener which it contains closely approaches those of the family of the Turbos; it would therefore be proper to place the Peristomians in the neighbourhood of the Turbinaceae, and to arrange them near the family of the Neritaceae, which has certainly less direct affinities with the Turbo family. It may be perceived that a classification which has been followed in a work, is impossible to express exactly the affinities, sometimes complicated, of the families of the same great group. To set forth these affinities, we know, M. M. Deshayes, but one method, that of comparison with lateral or parallel branches; and it is particularly in the group of Pectinibranchia, where the genera and species are so numerous, and the shell has the aperture entire, that the necessity of a better arrangement forces itself on the attention. Illustration.

M. Rang, in his ‘Manuel,’ places Pulmonaria at the head of...
the genera forming the Turbinidae of Pérussau, the first family of the Pectinibranchia. Valvata is also arranged in the same family between Magallus and Natire. Ampullaria is placed in the second family (the Trochiodes of Cuvier), between Nerina and Janthina.

The late Rev. Landsdowne Gilchrist makes his family Ampullariacea consist of the genera Paludina, Pachychlamys, Ampullaria, and Ceratodes.

Mr. Swainson, in his newly published treatise on 'Mollusca' (Cabinet Cyclopaedia, 1841), reduces the Ampullariacea to a subfamily of the Turbinidea, and this subfamily comprehends the following genera and subgenera: Valvata, Ampullaria (with the subgenera Pachychlamys, Lanistes, and Ceratodes), Paludina (with the subgenera Paludina and Natire), and Melanodura. The Ampullariacea are immediately succeeded by the Melaniacea.

Valvata. (Müller.)

Generic Character.—Animal with a very distinct head prolonged into a sort of widened proboscis; tentacles very long, sublateral, slightly curving outwards, very much approximated at the base, pointed at the extremity; eyes sessile at the posterior side of their base; foot bilobate anteriorly; branchial long, pectiform, more or less capable of being exerted out of the cavity, which is largely open, and provided at the right of its inferior edge with a long appendage simulating a third tentacle; main organ retracted within the respiratory cavity.

Shell discoidal or conical, subumbilicate, the whorls rounded and distinct, the aperture rounded or nearly round, its borders united and tectinct.

Operculum horny, round; its elements concentric and circular.

Mr. Swainson is disposed to regard Valvata as a subgenus of Paludina.

Valvata, with its shell, creeping.

Geographical Distribution of the Genus.—This genus appears to have been found as yet in Europe and North America only. M. Deshayes, in his Tables, makes the number of living species four, and names Valvata piscinalis as the only species living and fossil (tertiary). In his last edition of Landsdowne the number of recent species recorded is six.

Example. Valvata piscinalis.

Description.—Shell conoidal, globose, subtrigonal, umbilicate, white; whorls four or five; apex of the spine obtuse.

Locality, &c.—This little shell, which has four complete whorls, without including the apex, inhabits rivulets and ponds in England and France, and is, in all probability, to be found in Europe generally.

Paludina. (Lám.)

Generic Character.—Animal furnished with a prososeculiferous head; mouth toothless, but containing a small lingual bristly mass; tentacles conic, elongated, contractile; eyes at the external base of the tentacles; foot oval, with a marginal furrow at its anterior part; male organ very large, swelling up the right tentacle, whence it comes forth from an orifice situated near its base; anus at the extremity of a small tube in the floor of the (plancher) of the respiratory cavity.

This is substituted by Mr. Swainson for Prososeculum of Gilchrist, on the ground that the name has been already used in ichthyology, but Prososeculum is a hybrid word, derived from Greek and Latin roots. 'Soseculiferus' would be free from the last objection.

Shell furnished with an epipodium, conoid, having the whorls of the spire rounded, and the apex maculated aperture rounded, oval, angular at the summit; the borders united and tectinct.

Operculum horny, its elements concentric, with its summit concave.

Lamark states that the Paludinae, many species of which have been confounded with the Cyclomatica, Balanina, and Turbinidea. Inhabit fresh waters, pass the winter live in brackish and even in quite salt waters. For breathe water only, like the Valvate, with which they have a great affinity; but their branchial are internal, and their further distinguished from that genus by the form of their aperture, such as longer than it is side of the tongue called by the last whorl, which presents an angle at its summit. Their habits he describes as being very nearly the same as the Lymnae, like which the Paludinae may be seen spawning at the surface of the water.

M. Deshayes, in the last edition of Lamark, remarks that Lamark knew the most common species of Paludina, and referred it to his indigested genus of Helixes, under the name of Helix vintara. Müller withdrew the form from the genus Helix, and, believing that he saw sufficient affinities between it and the Nerina, united both genera under the latter name. Lamark rectified the errors of former zoologists, gave the genus its proper place, and characterised it clearly; in this he was aided by the anatomical researches which Cuvier bestowed upon the large species of Paludina belonging to our fresh waters.

M. Deshayes goes on to observe that the shells of the Paludinae are generally delicate, oval-globose, rarely elongated, and subtrigonal; the aperture, with a complete peristome, is always modified by the Turbinidea, and, except when it is almost parallel to the longitudinal axis. As in the operculum, generally delicate, sometimes thicker and subtrigonal, the shell exactly, and is very distinct from that of the Turbinide and Cyclomatica; it differs also from that of the Littorina.

This operculum is not formed spirally; the summit is subcentrical, and its growth is effected by laminae superadded to its external surface.

Geographical Distribution of the Genus.—This form is widely spread. Species have been found in Europe, Asia, Africa, and America. The European species are the inhabitants of temperate climates. M. Deshayes observes that the greatest number of the species live in fresh waters, and that they are met with in a great number of various localities on the earth's surface. They appear nevertheless to be more common in the northern than in the southern hemisphere; but perhaps, as M. Deshayes remarks, the difference may be attributed to the state of observation. Some small species, he adds, live in brackish waters, where they are found in great abundance.

The number of recent species of Paludinae given in the Tables of M. Deshayes is twenty-five, and of these Paludinae Achateina, unicolor, and impura (tenticulata), are said as living and fossil (tertiary). In the last edition of Lamark, the number is twenty-one only, but this is below the mark.

Paludinae Genicula and Magnisosa, Conrad, are, it may be mentioned, the subgenus of Paludinae.

Example. Paludinae vintara

Description.—Shell ventricose-conoid, thin, diaphanous, very delicately striated longitudinally, greenish brown, with
brown-red obsolete transverse bands; five turgidly-rounded whorls, the sutures strongly marked.

Locality, &c.—Fresh waters, rivers, and ponds of England, France, Germany, &c.

Patula vivipara. (Female.)

a, Shell of an adult, with young shells in it; b, operculum; c, young shell before exclusion.

The genus Nematura, Bonn., arranged by Mr. Swainson as a subgenus of Paludina, is thus characterised.

Shell thin, nearly oval, somewhat compressed from back to front; whorls few and rounded, spire acute, last whorl largest but contracted near the aperture; aperture small, oblique, rounded anteriorly; peristome continuous and thin; operculum spiral, horny, and with few volutions. Mr. Sowerby has described two recent and one fossil species, all three very minute, in the Magazine of Natural History, new series.

Ampullaria. (Lamarck.)

Generic Character.—Animal globular or planorbiform; foot large, delicate, and subquadragular, largely truncated anteriorly. Head flattened, terminated anteriorly by a pair of conical buccal tentacula; two great subulate tentacula nearly as long as the foot, supporting at their base oeniferous peduncles, sometimes separated throughout their length. No jaws, but a lingual bristled ribbon. A respiratory canal formed by the mantle, but not leaving any trace on the shell. Branchial cavity of great size, largely open anteriorly, and whose upper wall is doubled so as to form a great aperineous sac. (Deshayes, principally.)

Shell furnished with an epidermis, generally not stout, but globular, ventricose, and umbilicated; spire very short, the last whorl much larger than all the others put together; aperture oval, rather longer than it is wide, borders united, the right lip truncate.

Operculum horny or shelly, rarely calcaceous, rather delicate, composed of concentric elements, the apex submarginal and inferior.

Ampullaria dubia, animal in the shell creeping. (Goulding.) a, operculum; b, the right siphon; c, the left siphon.

In some species, A. globosa for example, the margin of the aperture is thick and grooved

M. Deshayes (last edition of Lamarck), observes that all the operculated fluvial shells were arranged by Müller in his genus Nerita. Linnaeus confounded some of them with the Helices, and under these two generic denominations

Ampullaria dubia, showing the lower side of the foot, &c. (Goulding.) The animal is represented as ascending to the surface of the water to breathe, and with the respiratory siphon exerted; a, the operculum; b, the right siphon; c, the left siphon.

Animal and shell of Ceratoles fasciata. (Goulding.) Ampullaria Cornu Arctia, Sowerby. (Goulding.) 1, the animal creeping; 2, the animal in a supine position; a, operculum; b, the right siphon; c, the respiratory siphon.

3, head, tentacula, eyes at their base, and cervical rim.
were then indicated the small number of *Amphullaria* known to those authors. Bruguière afterwards removed the species into his genus Bulimus, and Lamarck then established the genus under the name in which it first bears, without however any knowledge of the animal, and the absence of this information led him to comprehend under his genus many fossil species which have not its characters. "At present," continues M. Deshayes, "when the animal is seen in a more correct state of preservation in consequence of its organization many have been brought alive into Europe, we have presented to us the means of completing the characters of the genus and of rendering it more natural by the rejection of all the species which do not include all the characters of the true Amphullaria, and those which are distributed among other genera. Thus it is, as we have already had occasion to observe, that the *Planorbis Cornu Arietis*, provided with an operculum, and the animal of which has been figured, belongs, in reality, to the genus *Amphullaria*. We are at a loss how to judge of the true characters of this animal."

Before we follow M. Deshayes, as we presently shall, to an inquiry with regard to the organization of this remarkable genus, it becomes necessary to advert to the scutellum of *A. scutellifera*, or *A. depressa*, which first published with an error of deference to Lamarck, the true place of the *Planorbis Cornu Arietis* of that zoologist, and placed it among the *Amphullaria*, in its true position. (Genera, No. 4.) For this he was sharply censured by Mr. Swainson, in his interesting Zoological Illustrations (title of *Amphullaria Globosa*, by Mr. Cuvier, p. 119).

Specimens however soon came into hand with the operculum, thus destroying the principal ground of Mr. Swainson's severe criticism, and the knowledge of the animal soon extinguished all doubts as to the propriety of Mr. G. R. Sowerby's opinion. (See further, *Mollusca*, vol. xiii., p. 499.) We deem it necessary to call the attention of the student to this, that he may not be misled by the observations of a zoologist so justly distinguished as Mr. Swainson; indeed, he himself, by the position which he has assumed in his late treatise on "Malgologie," virtually negates his former judgment.

*Amphullaria* have been, as has been before hinted, brought to Europe alive. The first, we believe, was sent to Paris by M. Caillaud from the Nile. That naturalist, during his second journey, collected several hundred specimens which he distributed generously among collectors. One correspondent had been anxious for the fluviatile mollusks found in the Nile. The person employed to collect these, after having gathered a large quantity of river mollusks, attempted to give them to the living state, but they got into a box of bran (son). This box was delayed on its road by the operation of the quarantine laws for four months, and when it reached M. Caillaud, was in such a state, from the putrefaction of the greater part of its animal contents, that he sent it back to the water. To his no. small surprise he found, a few hours after, the greater part of the *Amphullaria*, which had been shut up with this mass of putrefaction, quietly creeping about upon the mud. He gave many individuals to M. Deshayes, who kept them alive from four to five months. The latter zoologist remarks that, since that communication, Mr. Sowerby, in the Zoological Journal, and M. Quoy, in the Zoology of the Astrolabe, have given the figures of many other species of *Amphullaria*, many of which have been brought alive into Europe. We know of no other figures of *Amphullaria* in the 'Zoological Journal' than those illustrative of the Rev. Landseer's paper above copied.

On the 25th of October, 1833, Mr. Cuming, so well known to all naturalists, arrived in London, which he has contributed to our knowledge of the Mollusca by his collections from the west, and who is now employed in the same laudable pursuit in the east, brought to Mr. Broderip a specimen of *Amphullaria globosa*, expressing his opinion that it might be alive. Mr. Broderip immediately placed the specimen, in a deep dish with some earth at the bottom, which was covered with New River water, and set it before the fire. On the 25th the animal gave no sign; but on the 30th it came forth and soon showed tokens of vigorous life. It was afterwards removed into a globular glass vessel, such as is used for gold and silver fish, with a good layer of earth at the bottom. The water and earth were changed periodically, and the animal continued to live in apparently good health for several weeks. Its death was probably occasioned by the difficulty of resisting the low temperature of the long cold winter nights, where there were no stoves, in short nothing beyond the ordinary fires of a dwelling-house. The specimen was in the museum of the Royal College of Surgeons.

The following anecdote is related to us by Mr. Broderip. 'It happened that it became an object of inquiry how aquatic animals, unable to respire except by means of a pectinated branchia, could remain alive out of the element apparently necessary to their existence. Nearly all the persons, he remarks, who occupied themselves with this phcenomenon, had thought that the animal, on retiring into its shell carried with it a certain quantity of water, which could not escape owing to the retention of the operculum, which closes the aperture with great exactness. Others thought that the humid air carried upon the branchia was sufficient to keep up the respiratory action. "We do not know," continues M. Deshayes, "whether there was anything in the structure of the animal which could explain the singularity, we soon perceived that the upper wall of the branchial cavity was doubled, and formed a great pouch, the aperture of which, being surrounded by another inner saccus, was placed above the edge of the branchia. Plunged in the water, the animal Latis.

This is one of those beautiful provisions which meet the naturalist everywhere. The tropical torrent and lake yield to the dry season and burning sun, but the *Amphullaria* secure in the possession of its water-bag, can endure, like the camel in the deserts, the want of fresh supply, and again fill the parched channel.

Geographical Distribution of the Genus.—The rivers and lakes of warm climates. Species, some of them very large (*A. Gageei*, *A. Cretus*, and *A. Gigas*, for example) have been found in the rivers of the southern portion of the latter. Olivier ('Voyage dans l'Empire Othoman, &c.') states that one is found in Lake Ma
eotia, in company with marine shells, but he did not succeed in obtaining the living animal. Mr. G. B. S. wrote: "One of these species, called by Olivier *A. carinata*, abundant in a neighbourhood river, but which, says Mr. Sowerby, if we may judge from his representation, has a horned operculum, and therefore rather to be considered as a *Pulmona*.

The Rev. Landseer-Guilding's paper on the genus *Pulmona*, the second of his family *Amphullariidae*, forming the first, into two sections. The genus is characterized as being furnished with a thick, margined, and often with a channeled lip; the operculum shelly.

§ 1

Umblies small: shell globose.

This section comprehends *Amphullaria globosa*, coruscans, and puncticulata of Swainson.

Umblies evanescent.

This section consists of only one species—*Amphullaria catena* of Swainson.

Mr. Guilding's genus *Amphullaria* is characterized in having the channeled lip and a horned operculum, and a divided into three sections.

§ 1

Shell globose; umblies comparatively large.

*Amphullaria baculata*, sordida, luculostoma, refera, and leucostoma of Swainson.

§ 2

Shell oblong; umblies comparatively small.

*Amphullaria oblonga* of Swainson.

§ 3

Shell globose; aperture narrowed; umblies very large and deep; columella obsolete.
Ampullaria effusa of Swainson. Mr. Guilding is of opinion that this species forms the transition through Ceratodes to the Planorbidae, and that it is probably more allied to that genus than to Ceratodes.

The genus Ceratodes of the last-named author is characterised as having a simple lip; a horny operculum; a discoid shell; a very large and deep umbilicus, and an evanescent columella. The sole species given by him is Ceratodes Coru Ariats above copied.

Mr. Swainson thus defines the genus Ampullaria:—Shell globose, rarely discoid, turbinate; spire very short; aperture oblong, pointed above, rounded below. The same author characterises the four subgenera as follows:—

1. Ampullaria robusta, Lam. Outer lip thick; operculum horny.

2. Ampullaria fusca, Lam. Outer lip thickened; operculum shell.


The number of recent species recorded by M. Deshayes in his Tables is twenty-four: in the last edition of Ampullaria, Lam., he gives twenty-seventeen species. Among these species, Mr. Swainson gives Helix Lutullicate, var. Melatin, as a synonym of his A. globosa, but the former stands as a synonym for A. fusca, Lam., in the last edition of the Animalia without Vertebrae. Mr. Swainson considers it distinct, and quotes the description and figure of Chemnitz, who, like other authors, considered it a variety of Helix Lutullicate.

The rivers of India are given as the locality, by Mr. Swainson.

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Ampullaria globosa: the aperture closed by the operculum.

Some of these Ampullaria, or Apple Snails, as they are called by collectors, are of large size, as we have already stated; and some of these are figured in Linzer, Chemnitz, and other authors. Some specimens, some from Mr. Broderip's collection, in the British Museum.

Ampullacera. (Quoy.)

The Ampullaria avellana of Lamarck was founded on the Nerita Xux avellana of Chemnitz, and was placed by Bruguier among his Bulim. Lam. Lamarck states that it was first seen from New Zealand. He observes that it is fluviatile, and not marine, as Bruguier supposed it to be. Considering the state of information when Lamarck wrote, no better position could have been assigned to the shell than that in which he placed it. Quoy however, having had an opportunity of examining the type, and supporting two very small sessile eyes on a fine yellow ground. Behind is a collar rather well-formed by the border of the mantle, which only leaves a round hole at the right side for the entrance of the air, and offers a little more

* See note, p. 450.

** The only known species is: Lutulicate Olivierii; brought by Olivier from the canals of Alexandria (Egypt). It is not ill-described by Mr. C. B. Sowerby, jun., as a reversed species of Ampullaria.

P. C. No. 1096.
Paludina.—Mr. G. B. Sowerby states that the fossil species abound in a thin bed immediately above the fresh-water bed at Headden Hill, and also in the Pettworth marl.

M. Deshayes remarks that the number of species found in a fossil state is considerable. Those on which no doubt can be thrown belong to the tertiary beds, and are particularly those of fresh-water shells. Some of those he observes, are quoted from the secondary strata, but they are, in his opinion, doubtful, it being possible to refer the casts on which they have been established as much to the genus Turbo as to the genus Paludina. Many species, he adds, have been confounded with the Chamaeleonidae and the Bulinidae, but their extreme abundance in the places where they are met with does not prevent the belief that they are terrestrial shells; and as they have besides the greater part of the characters of the Paludinae, M. Deshayes has referred them to this genus, in his work on the fossil shells of the environs of Paris.

The number of fossil species recorded by the last-named author in his Tables is forty-one (tertiary). This number, as regards fossil species only, is reduced to thirteen in his last edition of Lamarck.

Paludina vivara is noted in Mr. Mantelli's 'Tabular Arrangement of the Organic Remains of the County of Sussex,' (Geol. Trans., vol. iii., 2nd series), as occurring in the Weald clay and the Tilgate beds, and Pal. elongata from the clay between Hailsham and Goudhurst, and of which the shells are found in the Ashburnham beds (lower division of the Hastings deposits). Paludina carinifera, elongata, fluviorum, Susseriensis, and two or more species, probably new, appear in Dr. Pitton's list, in his valuable paper 'On the Strata below the Chalk,' (Trans. Geol. Soc., vol. iv., 2nd series).

Ampullaria.—Mr. G. B. Sowerby states that he is not certain that any fossil species of this genus exists; several, he adds, are mentioned by Lamarck, in the 'Annales du Muséum,' amongst the fossil shells of the environs of Paris; other species frequent the chalk and the London clay at Hordwell, and in the mixed stratum between the two fresh-water beds at Headden Hill, in the Isle of Wight. (Genera.)

M. Deshayes is of opinion that many fossil species given as Ampullaria have found a place among the Ampullariaceae; whilst others, such as Ampullaria aveliana, for example, ought to constitute a new genus, or should be referred to the Naticeae, whose characters they possess. 'If,' says M. Deshayes, 'we compare the shells of the Ampullaria with those of the Ampullariaceae, we perceive differences, not only because the form in the Naticea is more delicate, and without an epiphragm, but also because the incidence of the aperture on the longitudinal axis is different in the two genera. Nevertheless we must not attach too great importance to this character, which is usually found in Paris. Amongst the forms of the Ampullaria, it is not possible to find the forms from Terre-Neuve, which M. Poitot de la Sausatyy sent us; it has the form of an Ampullaria, its shell is delicate, and has an epiphragm, its umbilicus is without a callousity, and, notwithstanding its porous operculum, is entirely that of a Naticea. The animal itself does not differ essentially from the other Naticeae, except in the amplitude of the foot, and in the mantle.'

M. Deshayes goes on to state that up to the time when he wrote (1836) there had barely been found any fossil species of Ampullaria about which there is not some doubt. These shells which he has retained in the genus, from the character of the aperture and the small thickness of the shell, are, he says, never met with except in marine formations. They are usually smaller shells, and the animals produced then were different from those of the Ampullaria properly so called. As these species have the characters of Ampullaria, and we have no means of ascertaining the analogy of the animals, we are obliged to have recourse to the region of the shelly limestone, exclusive of those alone. But a little time since, he remarks, the belief was general that fossil Ampullaria belonged exclusively to the tertiary beds; but it is now known that this genus occurs through all the 'terrains de sédiment,' for Mr. Sowerby has recorded a fine species in the transition beds, and M. Deshayes says that he knows many others in the oolite series, and even in the lower chalk. (Last edition of Lamarck.)

The number of fossil species recorded by M. Deshayes in his Tables is fourteen (tertiary). In the last edition of Lamarck the number is sixteen.

The genus occurs in the list of the fossils of Lower Strytin, given by Professor Sedgwick and Mr. Murchison, in their valuable paper 'On the Structure of the Eastern Pen. and its Adjacent Hills, ii., second series,' and 'Tabular Arrangement of the Organic Remains of the County of Sussex' (ibid.).

In the last-mentioned catalogue Ampullaria paviei and signaretina are noted from the blue clay of Bracklesham and Cuckfield, and A. paviei is also given as occurring in the chalk. A. signaretina occurs with a ? in the list from the chalk marl, and Ampullaria canaliculata is recorded in the same paper as occurring in the gault, or Folkestone marl.

Peristomium, in mosses, is the ring or ring-like structure in which the oral opening is closely fitted, and which, when the operculum is closed, is the mouth of the moss plant. Professor Ludlow regards the shape of the peristomial canals, as incomplete lesions.

Peritoneum is the membrane by which the walls of the abdominal cavity are lined, and all the abdominal organs are covered. The name is also sometimes applied to the cavity itself. The arrangement of the peritoneum is very similar to that of other serous membranes, except that a mucous membrane of the tube communicates with the mucous membrane of the opposing tube, and this is indirectly exposed to the external air. It is the peritoneum, and the epithelium coating it, that is responsible for the shiny surface, and which by its duplications forms mesentery, omentum, and other folds by which the organs are attached to each other and to the walls of the abdomen, and through which their vessels pass. (Marsyan.)

Peritonitis is an inflammation of the peritoneum. It may exist either as an acute or as a chronic disease. The chief symptoms of the acute form are pain, swelling, and tenderness of the abdomen, accompanied with fever and a frequent and small evacuations of fecal matter. The acute inflammation is usually more severe than that of other inflammatory diseases of the intestines or other abdominal organs. It is acute and cutting, and sometimes occurs in paroxysms; it is generally diffused, but occasionally it is almost confined to a single part of the abdomen; but most of its distinguishing character is that it is greatly increased by pressure, so that in a severe case the patient cannot support so much as the weight of the bed-clothes, but lies on his back with his knees drawn up, and breathes quickly and lightly, moving the diaphragm and occurring small evacuations. The primary history of peritonitis is usually terminates fatally in five to ten days, the patient becoming more and more depressed, and all the symptoms regularly increasing till within a short time of death, when the pain commonly ceases, and a depression of the general condition very much increased. The usual morbid effects of peritonitis are the effusion of serum with lymph or pus into the cavity of the abdomen, and adhesions of the opposite surfaces of the abdominal organs. After death from this disease, the abdomen and the surfaces of the organs chiefly or most affected, are found thickened, swollen, and vascular, covered with blotsches of diluted blood-vessels, and more or less adherent to each other, and the thickened parts of the peritonitis usually terminates fatally in five to ten days, the cause being a morbid excitation of the lymphatic system which is excited between the layers of the peritoneum by the external cause which, if the disease is protracted, produces a strangulation of the blood-vessels adjacent to the wound, heavy blows and falls on the abdomen by penetrating wounds inflicted in operations for hernia: in other circumstances, by the passage of foreign bodies into the cavity of the abdomen, and especially by the ulcerous perforation or accidental rupture of any of the organs of the abdomen.
tained within it, and the escape of their contents, circumstances which are productive of the most certainly and pernicious form of peritonitis.

From these causes acute peritonitis may occur at all periods of life, but it more frequently affects persons of the middle age than any others. Women in child-bed are peculiarly liable to it. They may be attacked either with common peritonitis, presenting no remarkably peculiar symptoms or effects; or they may have that which is especially called puerperal peritonitis. In cases of the latter disease however the peritonitis is not always the most important symptom, but must rather be regarded merely as one of the circumstances, the particular form by which the patient is most affected, and which often assumes the character of an epidemic.

The appropriate treatment of peritonitis consists in the early employment of copious general bleedings. The quantity of blood abstracted, the general the more; blood should be drawn from near the seat of the disease by the repeated application of numerous leeches, and hot fomentations should in the intervals be assiduously applied to the abdomen. Of internal medicines the most effectual is calomel, of which, and of which the quantity is regulated by the nature of the case; for grains or more, with one or two grains of opium, should be given at intervals of about four hours, and afterwards smaller doses till a slight salivation is produced. During all the time of the treatment, the lowest diet only should be given till the slightest indication of improvement shews that case, and generally in the later stages of the disease, a more nutritious diet may be given, but there is perhaps no affection in which relapses are so liable to occur in consequence of the early or injudicious use of stimulating medicines.

Acute peritonitis sometimes, after fifteen or twenty days' continuance, assumes a chronic form; or the inflammation may from its commencement be of slow progress. In either case the symptoms are usually very obscure; the pain being generally presented by distress in the epigastrium,

the swelling or tension of the abdomen occurring only at a late period of the disease. Its more important symptoms are the low fever, the constant thirst, the hectic flushings of the face, the emaciation, languor, and regularly increasing chills, which are incessantly repeated (3 Jud., 9); and in that case generally in the later stages of the disease, a more nutritious diet may be given, but there is perhaps no affection in which relapses are so liable to occur in consequence of the early or injudicious use of stimulating medicines.

PERIWINCLE, or PERIWINCLE, the vernacular name for the well known species of Turbo which is had at Lamezia, and is sold as such particularly to the poorer classes. In very hot weather and the decline of the year they are often unwholesome, especially if there be no predisposition to disorderly functions of the abdominal visceras prevalent. Instances have been known when the use of the fish has produced diarrhoea.

The name is applied to the green tree which has been followed by a fearful amount of death consequent upon attacks similar to cholera, if not cholera itself. Taken in moderation and when in high condition, they do not seem to be an unhealthy food. The Linnaean name for the genus is Turbo littoreus. Pennant states the belief of the Swedish peasants that when these shells creep high up the rocks, they indicate a storm from the south. Linnaeus quotes Stroem, the Norwegian, for a different augury when it creeps up the strand; he says that it denotes a land wind and a calm in-shore,—quando litora aestucent, indicent ventum à terra, pacatam ad littus. The food of the periwinkle is generally considered to be vegetable only. [Turn- nides.]

PERIZONIUS, JAMES VOORBOECK, born at Damm in the province of Groningen, in 1651, studied at Davenport and afterwards at Leyden under Grauwits. He chiefly applied himself to philological and historical studies. In 1674 he was appointed rector of the gymnasium of Delft; in 1677 he was made professor of eloquence and history at Franeker. In 1693 he removed to the professorship of history and the Greek language. He died at Leyden in 1715. Perizonius was one of the most distinguished scholars that Holland has produced. He published numerous dissertations on various learned subjects, and ediltions of Qu. Curtius, of Dietys Cretensis 's 'Tractatus de arte Latin and Greek authors. Niccrom, in his 'Mémoires,' has given a list of his works, which however is not complete. Among his more important works, the following may be mentioned: concerning the translator of the 'Neoplatonici historice, in quibus quattuor prima in prima Romanarum historiae, et infra quatuor in ab urbe Guise autorius notantur; multa etiam illustrator atque emendator,' sive, Amsterdam, 1685. In this work the author compares many passages of various historians relating to particular events, the various accounts of language, habits, and civil polity; it is a work full of learning, and useful to classical scholars: 2. 'De Usu atque Utilitate Graecae Romanque Linguae,' 3. 'Rerum per Europam Sacculo XVI. gestarum Commentarii historici,' a work of great importance: 4. 'Disquisitio de Praetorio;' 5. 'Dissertatio de Ezra Gravi;' 6. 'Dissertatio de Morte Judae;' 7. 'Origines Babylone et Egyptiacae,' 2 vols. Sive, Leyden, 1711; a work, the importance of which has been superseded by the more recent investigations of the learned and philologists. The 'Opuscula Minoria' of Perizonius, consisting of orations and dissertations, were published at Leyden in 1740, with a biography of the author. Perizonius left his MSS. to the Leyden library.

PERIYURY, the common law of England, is the offence of falsely swearing to facts in a judicial proceeding. To constitute this offence the party must have been lawfully sworn to speak the truth by some court, judge, or officer having competent authority to administer an oath; and, having sworn, he shall have wilfully wittingly sworn a falsehood in a judicial proceeding respecting some fact material to the subject of inquiry in that proceeding. In a legal sense therefore the term has a much narrower import than it has in its popular acceptation. It is said by Sir Edward Coke (3 Jac., 9) to be an 'onion of a gentleman, and not a small nor a little matter, and not ut putat, sed sic meminit, sed ut credit, &c.; but this doctrine has been long since exploded; and it is now clear that a person may commit perjury by swearing that he believes a fact to be true which he knows to be false. It is important to note that the term perjury, whether the false statement has received credit or not, or whether any injury has been sustained by an individual in consequence of it. The character of this offence therefore: 1. 'Anon exgesis is not the violation of the religious sanction of an oath to the wrong done to the person or property of another, but the injury done to the administration of justice by false testimony or information in a judicial proceeding. (Fifth Report of Commis- sioners on Criminals. Enq., 2.) The history of this offence in the common law is entirely dependent upon the history of the trial by jury. [Jury.] Where perjury is mentioned by Bracton and Fleta, these ancient authors exclusively allude to the offence of jurors in giving false testimony. It appears to have been originally merely witnesses, speaking from their personal knowledge of the facts, and sworn to speak the truth, their misconduct in giving a false decision might be justly treated as perjury. As population and civilization increased, the offences became more and more changed, and witnesses were called in order to inform the jurors respecting facts of which the latter were commonly ignorant, though the institution was originally founded upon the presumption that they must necessarily be acquainted with them. It is probable that this alteration did not take place at once, but that it was one of those gradual introductions by means of which laws silently adapt themselves to changes in national habits and circumstances. At all events, there is no trace in the statutes or in the reported proceedings of the courts, of any penal law against perjury in witnesses, as distinguished from that of jurors, earlier
than the reign of Henry VIII.; the date of the introduction of the witness's oath to speak the truth, in use at the present day, is unknown, and no form of process for securing the attendance of witnesses (except where they were added to the jury) seems to have existed before the reign of Elizabeth. [Footnote: These facts tend to show that the offence of perjury has been gradually moulder toward the present and finite character, by the corresponding change in the functions of the jury. This change however was complete in the time of Sir Edward Coke, as he defines perjury nearly in the same terms to which it is described in more modern treatises.] (3 Inst. n. 163.) A defendant in equity is guilty of perjury by false swearing in his answer to a plaintiff's bill. The defendant is in fact also a witness, for he is bound to answer on oath to the matters of fact in controversy, and if he may reasonably answer the whole or any integral portion of the defendant's answer as evidence against such defendant. In the case of an answer in equity, the offence of false swearing falls exactly within the definition given at the head of this article. A fine, in the older constitutions, as in the common law, were, discretionarily fine and imprisonment, and the pillory, which latter punishment was abolished in 1837. To these was added an incident probably derived from the punishment of jurors in ancient times, namely, a perpetual incarceration under the same condition. Further punishment was authorised by the statute 2 George II., c. 23, s. 2, by which it was enacted that imprisonment with hard labour for seven years might be awarded, or transportation for a like period. A fine of 40s. by 6d. is sufficient to procure any person to commit perjury; and it is essential to this offence that the false oath should be actually taken. The same punishment is assigned to subornation as to perjury. Besides perjury and subornation of perjury at common law, there is a statute, 9 Geo. III., c. 9, of 1799, respecting these offences: but as this enactment is more limited than the common law, both in the definition of the crime itself and in the punishment to be applied to it, it has seldom been used in recent times; and within the last century there have been few if any instances of prosecutions under this statute. There are also many statutes by which oaths are required as a sanction to statements of facts under a variety of circumstances, and otherwise than in judicial proceedings; and by it no declaration that false swearing in such cases shall amount to perjury, and be punishable as such. The Commissioners on Criminal Law have pointed out the practical objections to provisions of this kind, and have suggested a mode of rendering the law upon the subject effective, so as not to draw the distinction between the dangerous crime of false testimony in courts of justice and mere false swearing to facts on other occasions. See Fifth Report, pp. 25 and 50.

By the 8 & 6 William IV., c. 62, declarations may now be admitted for oaths in many extrajudicial proceedings.

OASTS.

PERM, an extensive government of Russia, is situated partly in Europe and partly in Asia, between 56° 30' and 61° 30' N. lat. and 53° 30' and 64° 40' E. long. It is bounded on the north by Wogotka and Tobolak on the east by Tobolak, on the south by Orenburg, and on the west by Ugra. The area, according to Schubert and most other writers, is about 125,000 square miles, or more than double the area of England and Wales. The population, according to Schubert, is 99,000; according to Herzschellmann and Cannich, it is 1,270,000; M. Köppen however made it amount, in 1838, to 1,488,800.

This government is mountainous, and is divided by the Urals into two unequal parts, the smaller of which, though the loftiest summit of the Ural chain, the Pavlin-skoi-Kamen, is 6,400 feet above the level of the sea, the chain rises so gradually that travellers approaching it on the road from Tobolak do not find themselves at the summit (which, on this road, it is true, is only 1,500 feet) without perceiving that they were making an ascent. The breadth of the chain varies from seven to seventy miles, and the part belonging to the government is 450 miles long. The mountainous parts are covered with forests, in some of which there are immense marshes. The southern parts of the government, on the European side, are fertile and well cultivated, but the other portions are more suitable to pasture than tillage. The course of the rivers is determined by the Urals. The principal river on the west side is the Kama, among the numerous affluents of which is the Tchousovian, which flows from some lakes at the foot of the Urals chain, and joins the Kama above the town of Perm. On the other side of the mountains, the Southern Urals chain, the Sycha flow eastward to join the Tobol. There are above 356 lakes, most of them east of the mountains. There are also sulphurous and other mineral springs. The climate is unequal, being very rigorous in the mountains and in the eastern parts but mild towards the south-west. It is however generally healthy. Agriculture employs a great number of hands, but the government does not produce corn sufficient for the consumption of the inhabitants. Rice, barley, oats, potatoes, and flax are grown. The climate is so rigorous that the coast of the Urals is not inhabited by any large proportion belongs to the crown, consist of the pene, the larch, the birch, and the lime-tree; in the south-east the oak, the ash, the birch, and the elm are found, and in the districts of Tchelyndy and Werkhobouine, the cedar. The government of Perm owes to its richness to its minerals, and the working of the mines employs the greater part of the inhabitants. The principal mineral products are lead, gold, silver, salt, marble, Jasper, agates, amethysts, loadstone, and some diamonds. Of late years they have yielded on an average 250,000 poods (pood = 36 lbs.) of gold and 100,000 poods of platinum. The richest gold-mines are the Kama and the Seikina. The crown possesses smelting-houses, in which 33,000 masters and workmen are employed; private individuals have 99 smelting-houses for iron and 35 for copper. The mines of the Urals mountains yield annually about 300,000 poods of gold, 200,000 poods of silver, and 50,000 poods of platinum. Of the whole of these products belongs to the government of Perm, which also produces about seven million poods of salt annually.

The number of domestic animals is, in round numbers, about 500,000 horses, which are necessary for the service of the mines and the cattle; the number of horned cattle: 680,000 sheep; 390,000 swine; and 500,000 goats. The Bashkirs breed a great quantity of bees: formerly they had camels, but the race appears to be extinct. The Wogots in the north.

Three-fourths of the inhabitants are Russians. The remainder are Permians, descended from the ancient inhabitants of the country between the Ural mountains and the White Sea, and various Tartar races. All the inhabitants of Perm are Christians, and of whom 78,000 are Tartars and Bashkirs of both sexes, who are Mohammedans, and a very few Tcheremisow and Wogots, who are pagans.

There are some manufactures of cloth, leather, soap, oil, and of wool and silk. Trade is very brisk and is assisted by the facility for water-carriage on the Kama and its tributaries, and partly owing to the thirty-nine annual fairs, eighteen of which are held in the towns, the most considerable being that of Irbit. With respect to education, Perm is under the university of Kazan, and education is confined to a very small portion of the inhabitants. According to Schmidt, whose book was published in 1836, there were, by the latest accounts that he could procure, which seem to have been of 1832, 62 schools, with 123 teachers and 4,185 scholars. The population of the town at that time, as he does, at about 1,200.

The town of Perm, the capital of the government, is a modern town, having been built in obedience to a statute of Catherine II., issued in 1780. It is situated in 55° 35' N. lat. and 52° 30' E. long. at the confluence of the Igoums and the Kama. The streets are broad and regular, and houses almost all of wood, and the town is surrounded by a boulevard planted with trees. There are only two churches, both of which do not look like a Russian town. It is described by Mr. Engelhardt as a dull and insignificant place.

The population is about 10,000. It is a bishop's see. Ekaterinenburg, with 12,000 inhabitants, is a place of much greater importance. [Ekaterinenburg.] Kurgat, at the confluence of the Sycha and the Sylva, a fortified town which has about 6,000 inhabitants, has manufactures of leather and textiles.

Within a mile of the town, on the banks of the Sylva, there are caverns in the rock, which appear to have been formerly inhabited by many thousand families. Soltmaslak, at the
conflух of the Ufolfka and the Kama, has 5,000 inhabit-
ants, five churches, and two convents. The salt-works at
Solikamsk belong to the crown, and yield, in 1,300,000
pounds annually; and those belonging to the Stroganov
family, four millions and a half of poods. Owing to the
road to Siberia passing through this town, it has a con-
siderable trade. There is a botanic garden, in which the
principal plants of Russian and Siberian are cultivated.
Nischni-Newiskans has 12,000 inhabitants, and can manu-
siderable manufactures of lacquered and japanned ware.
Irib, or Irbitz, on the Neiwa, near its confluence with the
Irbit, has 38,000 inhabitants, and is celebrated for an anni-
ual fair, which is fished to Carl by the Bokharian, Poles, Austrians, Greek, &c. merchants. The value of the goods brought to
the fair is about 35 millions of rubles, and is annually increasing.
In 1838 the value of Russian goods was 30,387,630 rubles;
of British goods, 385,630; of French, 80,000; of Cotton, 22,000; of Kharkovian, 174,000; horses, 15,000; total, 34,800,000 rubles. Irbit is a
nest, regularly built, and rapidly improving town.
(Schmidlin, La Russie et la Pologne; Hirschelmann, Handbuch; Erman, Reise nach Siberien; Russian Official
Permanents.)

PERNAR


PERNAMBUCO, a seaport in Brazil, situated in 8° S. lat.
and 44° 54' W. long. It consists of two towns, Recife
and Olinda. It lies on the south coast of South America
and is situated on the north. Opposite Recife this reef runs parallel to the shores and about 200
yards from it, and resembles a large flat wall, elevated about
six feet above low-water mark. This reef, which is per-
pendicular on the land-side, and slopes gradually towards
the sea, is intersected by a break water, about 140 yards
north of the entrance. This break, which is rather narrow,
is the entrance of the port. Inside the reef the water is
not agitated by the swell of the sea, and vessels are com-
tpletely sheltered. The port itself is divided into two parts
by a shoal. The southern part, called Porto do Mesquita,
is only used by vessels not drawing more than 14 feet of
water. Larger vessels remain in the northern harbour,
off the entrance, which is called Pocu, and is some-
times closed to the sea, especially during spring-tides, which rise five feet. The houses are of different ages,
built, and the streets are narrow, but generally paved.
The Rua das Cruzes, which is the only wide street, contains
many substantial houses. The storehouses are extensive.
Mr. Bennett describes the place as consisting of two conic and
equal, and a third externally acutely built, and having one internal tube, as the rest absent. One national and imperfectly represented by Bosman under the name of
Pato. Genetic Character.—Face somewhat lengthened. Limbs
subequal. Tail moderate. Index very short, the unsual
phalanx alone exserted.

Dental formula.—Incisors 4 6 4; Canines 1 1; Molars
4 4 3 3

Mr. Bennett further describes the upper incisors as being
subequal, and the lower as shorter and sloping (decollate);
the canines as conic, compressed, with the anterior and pos-
terior margins acute; the first upper molar as smallest, the
second as equal, and the third as acute; the incisors very
equal, with the tubercles being two externally and one internally;
the fourth like the preceding, its internal tube rather
larger than the rest (absent in the young specimen); the
third incisor as long as the second, being the rest absent.
Description.—Colour chestnut, paler below, with a few
ash-coloured hairs interspersed; fleece woolly.
Locality.—Sierra Leone.

This, with another animal (Aulacodus Setivdianus, Temm.,) was presented to the Zoological Society of London
by Mr. Boyle, colonial surgeon, Sierra Leone. The brines
of the region and the sale of it have often been erroneously
curried upon the homeward passage, unfortunately too weak for their perfect preservation, but they were, on
their arrival, transferred to strong spirit, with the view of
preserving them as much as possible.

Mr. Bennett gives the following as the synonyms of this
highly interesting animal: Pato, Bosman (Guin., ii, 35,
No. G.) ; Lemur Poito, Gmel. (Linnaean, Sys. Nat., 42); Nycticebus Poro, Geoff. (Ann. Mus., xix., 1857); Galago Gui-
neumet (Desm., Mamm., 104, No. 127); and describes the
head as rounded with a projecting muzzle, the nose
lateral, small, sinuous, with an intermediate groove extend-
ing to the upper lip, the tongue rough with minute papillae,
rather large, thin, and rounded at the tip, and furnished
beneath with a tongue-like appendage, which is shorter than
the tongue itself, and terminates in about six rather long
lanceolate processes, forming a pectinated tip. The eyes
are small, round, somewhat lateral and oblique; the ears

Olinda is beautifully situated upon a cluster of eminences
which are connected with the mountains farther west. It
was once a considerable town, but has been on the decline
for the last two centuries. It is rather well built, contains
many convenst, an episcopal palace, finely situated; a
botanical garden of trees and exotic plants, mostly brought
from Asia; and a college, with professors of Greek, Latin,
French, geography, botany, universal and ecclesiastical his-
tory, philosophy, dogmatics and moral theology, and drawing.
Olinda contains about 1200 houses and 8000 inhabitants,
and is inhabited by rich individuals and men of letters.
The Cidade do Recife contains more than 60,000 inhabitants,
chiefly occupied in its extensive commerce. S. Antonio is
by far the most populous of the three towns, and most of
its inhabitants are mechanics. The exports of Pernambuco,
in 1828, consisted of 1,513,120 arsanas of sugar, 33,400 ba-
els of Cotton, 53,249 poods of Rice, 25,711 poods of Tobacco,
and 74,000 poods of Olive-oil; 600 pips of vinegar; great quantities of British manufactured goods, espe-
cially of cotton; silk goods from France and China;
and several other articles of less amount. The number of
vessels which annually depart from this port to Europe and
North America, is about 350. The port was taken by the
Dutch in 1630, and remained in their possession to 1654. The
Dutch did more for its public works in that short period than
has been done ever since.

(Henderson's History of Brazil; Spix and Martius
Reise in Brasilien.)

PERNAU. [Liebna]


PERODICTICUS, Mr. Bennett's name for a Lemuridus
species, probably, in his opinion, the animal noticed and
imperfectly represented by Bosman under the name of
Pato. Genetic Character.—Face somewhat lengthened. Limbs
subequal. Tail moderate. Index very short, the unequal
phalanx alone exserted.

Dental formula.—Incisors 4 6 4; Canines 1 1; Molars
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lateral, small, sinuous, with an intermediate groove extend-
ing to the upper lip, the tongue rough with minute papillae,
rather large, thin, and rounded at the tip, and furnished
beneath with a tongue-like appendage, which is shorter than
the tongue itself, and terminates in about six rather long
lanceolate processes, forming a pectinated tip. The eyes
are small, round, somewhat lateral and oblique; the ears
moderate, open, and slightly hairy both within and without; and the body rather slender, and the fingers moderately long. The index on the forehands is excessively short, the first phalanx being concealed, and the unequal phalanx (the only phalanx free) being barely large enough to support a rounded nail, which did not exist on the specimen, but of which there was an apparent citatax. Nails of latter sort; those of the hinder hands similar, except that of the forefinger, which, as in the Lemurus generally, is long, subulate, and curved. Tail of moderate length, covered with hairs resembling those of the body. Hairs generally long, soft, and white. A very small, pointed, marginal tooth in the middle, and paler at the tip; some few tipped with white. This arrangement produces on the upper surface and on the outside of the limbs a chestnut hue, slightly mixed with grey; the under surface is paler. Muzzle and cheeks mostly pale; the rest of the face, at a few scattered hairs. Length of the head two inches and two-tenths; of the body six inches; of the tail one inch and six-tenths, or, including the hairs, two inches and three-tenths. Breadth of the head, in front of the ears, one inch and four-tenths; distance between the ears four- tenths; from the anterior angle of the eye to the end of the nose seven-tenths; from the eye to the ear fifteen-tenths; length of ears behind, five, of their aperture eight, breadth five-tenths. Elaborate measurements of the anterior and posterior limbs are given by the author, to which we refer the reader.

Habits.—Mr. Boyle describes the animal as slothful and retiring, seldom making its appearance except in the night-time, when it feeds upon vegetables, chiefly, he believes, the Cactus. He describes it as knowing how to use the Day and Night.

Mr. Bennett remarks that this genus is readily distinguishable from the other Lemuridae by the comparative length of the tail. In this, he observes, in the moderate elongation of the face, in the moderate size of the ears, in the equality of the limbs, and especially in the extreme shortness of the index of the anterior hands, reside its essential characters. The latter character is regarded by Mr. Bennett as especially important, and he considers it as indicating its typical station in a family, all of which are distinguished by the preceding groups by a variation in the form of the index or of its appendages. 'In the Lemuridae generally,' says Mr. Bennett, in conclusion, 'the nail of the index of the hinder hands is elongated and claw-shaped, and unlike those of the other fingers, which are flat, as in the monkeys. This is frequently accompanied by an abbreviation of the index of the forehands, which becomes in loris, Geoff., very considerable, and is in Perodicticus carried to its maximum, that organ being here almost obsolete.' (Zool. Arc. 1853, 145.)


PERON. (Somme.)

PÉROUSE, JEAN FRANÇOIS GALUPE DE LA, a French sailor and navigator of the latter part of the 18th century, was born at Abbe in the department of Tarn, in 1741. He entered early into the French navy, and was appointed midshipman in 1756. He distinguished himself in the battle of Belleisle (1758), and was taken prisoner. After the peace of 1762 he returned to his native country. In 1773 he visited the East Indies, where he served to 1777. In the war from 1778 to 1783 he distinguished himself on several occasions, and in the beginning of 1782 he was sent with three vessels to take possession of the establishments of the English on the west coast of Africa. He afterwards went to the islands of the Caribbean, from which the company derives its name. He took Fort York on the 24th of August, without resistance, as there was no garrison, and after having ordered the fort to be destroyed, he re-embarked and abandoned it. Having been in possession of the English settlements in the West Indies, he went to the forests, and finding that they would perish with hunger or fall into the hands of the savages, he left some provisions and arms, an act of humanity which was acknowledged by the English. At a late date, he founded a manuscript of Hearte's 'Journey to the Coppermine River,' which he inclined to take to France, but Hearde declaring that it was his private property, he restored it to him, on the express condition that it should be printed on his return to England. A promise was made, but only performed thirteen years after.

After the re-establishment of peace (1783), the French government wishing to rival the English in making dis-

coveries in the Pacific, La Perouse was appointed commander of a squadron, consisting of two frigates, the Boussol and Astralobe. He sailed from Brest on the last day of August, 1785, and went round Cape Horn. After doubling Cape Horn, he sailed to 60° N. lat., and then coasted along the western coast of North America to Monterey in Upper California. This coast had previously been examined by Cook and Vancouver. From Monterey, he went north to San Francisco, and then along the eastern coast of Asia to Avastha in Kamtchatka. This is the most important part of his voyage, as he surveyed a coast which previously was unexplored. He then crossed the Pacific, and arrived in one of his officers, Lessop, with an account of his voyage, to Paris by land. After leaving Avastha he sailed to the navigators' islands, where the Astralobe lost her captain and eleven of the crew, who were killed by the natives. After touching at the Sandwich islands, the ship was wrecked off the coast of Brazil, but Governor Phillip had arrived for the purpose of founding the first British colony in Australia. From this place he was sent to Europe the continuation of the account of his voyage and after leaving Botany Bay he was never heard of. It was supposed that his vessels had been wrecked on one of the islands of Santa Cruz, also called Queen Charlotte Islands. This island is called by the English Wanieoar, or Wanieoar, and by the French, de Recherche. (La Perouse, Voyage autour du Monde.)

PERPENDICULAR (overhanging), the name given in geometry to a line or plane which meets another line or plane without inclining to one side or the other, so as to appear parallel to one of the two lines or planes. The subject will be considered in a mathematical point of view under Right Angles.

PERPETUAL MOTION. [Motion.]

PERPETUATION OF TESTIMONY. A party who has an interest in a controversy, but not an interest as an emitter, as a party who is in possession of property and fears that his right may at some future time be disputed, is entitled to examine witnesses in order to preserve that testimony, which may be lost by the death of the party. The right of a party to examine witnesses in order to aid himself in defending his claim, or before he is called on to defend his right. This is effected by such party filing a bill in equity against such persons as are interested in disputing his claim, in which bill he may pray that the testimony of his witnesses may be perpetuated. This is the only relief that the bill prays. If the prayer of the bill is granted, a commission issues to examine the witnesses, whose depositions are taken in the usual way in suits in equity. The depositions, when taken, are filed in the court, and are retained in the custody of the court which grants the commission. Whenever after such depositions are taken as evidence, they can be so used, by permission of the court, by the party who has filed his bill or those who claim under him, and they can be read by the direction of the court as evidence in any subsequent suit before the court to defeat the witnesses dead, or from any sufficient cause cannot attend. If the witnesses are living when the trial takes place, and can attend, they must be produced. A defendant to such a bill may join in the commission, and may examine witnesses under the commission, and he is entitled to and then deposit them as evidence in his favour at a future trial. (1 Mer. 434.)

A bill to perpetuate testimony may be filed by any person who has a vested interest, however small, in that thing to which he lays claim. The parties, defendants to such bill, have a right to cross-examine those persons who come forward to oppose the interference of the court. In order that the testimony which the plaintiff seeks to perpetuate may be good evidence for him at the trial, he must make this proper parties defendants to his bill, who may be generally described to such persons as would be necessary to enable the court to form a just judgment in the suit. Such parties are to be restrained and enjoined from interfering with the plaintiff's matters of fact, from interfering with the plaintiff's matters of law, from interfering with the plaintiff's right to have his case heard in the highest court which can act upon it. The evidence so taken may be read at the hearing of a cause, or at a trial at common law. It may be used at such a trial to prove the claim of the party, or the party who claims through or under them.

A bill to perpetuate testimony and a bill to examine witnesses De bene esse are sometimes confounded. The bill to examine witnesses De bene esse is only filed when action has been brought, and the plaintiff is afraid that his witnesses, owing to age or infirmity, may die before the trial
PER can take place, or he has only one witness to an important fact. Both these are in a sense bills to preserve of per- petuate testimony; but the one is filed before the matter which may be in dispute can be the subject of judicial in- vestigation, and the other is filed when an action has been already brought. As courts of law can now examine wit- nes's to the architecture of the Louvre, and were not necessary in those courts (1 Wm. IV. c. 22), an application to a court of equity for such purpose is no longer necessary.

Witnesses may be examined De bene esse in a suit in equity, when it is necessary to secure their evidence at a period when it is not expedient for their examination, or examination of witnesses in the cause. But this is only a provisional examination, and the evidence can only be used in the case witnesses cannot be examined at the proper time for the examination of witnesses in the cause. [Deposition.] PERPETUITY, the technical term for any contract or annuity which is to continue for ever; also called a per- petual annuity.

PERPETUITY. (Law.) [Settlement.] PERPIGNAN, a town in France, capital of the depart- ment of Pyrénées-Orientales, on the left bank of the little river Bassa, or Canals, with the Tet, 423 miles in a direct line south of Paris, or 676 miles by the road through Or- léans, Limoges, Cahors, Montauban, Toulouse, and Nar- bonne.

Perpignan was antiently a mere hamlet, called Correc, which gradually increased and became the capital of Rouss- iillon. Having passed with the rest of that province into the hands of the kings of Aragon, it became in 1439 the scene of the battle of Vilafranca between the allies, supported by Pedro, one of those kings. In 1474 it was besieged and taken by the French, and put to the sword by Alphonso 

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which at the time of Alexander was full of immense
treasures, which had accumulated there from the time
of Cyrus. (Diod. Sic, vii. 71; Strabo, xvi, p. 729.)

We know scarcely anything of the history of Persepolis.
The palace of the Persian kings and a part of the city
were burnt by Alexander (Arrian, ii. 13; Curt. v, 7:
p. 729; Diod. Sic. vii. 79); but it still continued to
be a place of considerable importance after his time
(Diod. Sic., xii. 22).

We read of an attempt by Antiochus Epiphanes
to plunder it, which did not succeed. (2 Mac, ix. 12.)

There has been considerable dispute among the
Persian name of Persepolis. Oriental historians say that it was
Istakhar or Estakhar (D’Herbelot, Bibliotheque Orientale);
and many modern writers suppose that Pasargadz and
Persepolis are only different names for the same place,
and that the latter word is the Greek translation of the
former. There are however strong reasons for believing that they
are distinct places. (Pasargadz.)

Persepolis was situated in an extensive plain, near the
union of the Araxes (Bendemir) and Cyrus (Aur).
The situation appears to have been very healthy and favourable
to longevity. Mr. Rich, when he visited the spot, heard of
several persons who had attained the age of a hundred.
(Narrative of a Journey to Babylon and Persepolis, p. 24.)
The ruins of Persepolis, which are usually called by the
inhabitants Takil-Minar, that is, the forty pillars, are
described at great length in Sir R. K. Porter’s Travels, vol.
i., p. 576, fol. [Persepolitan Architecture; Arrow
Headed Characters.]

Persepolitan Architecture. The remains of
buildings of the city of Persepolis, or in its vicinity, are so
few and so imperfect as to render it impossible to judge of
the style of architecture beyond a few particulars.
It seems to have had much in common with that of Egypt.
and yet to have differed materially from it in various respects.
Some has conducted the chambersewn out of the par-
dicular face of rocks, there are several specimens at Naqsh-
Rustam; yet these bear little similarity to the subterraneous
or excavated catacombs of Egypt, which are generally
of very great extent, and consist of one or more passages lead-
ing to different apartments; whereas these are very few.
The excavations are very shallow, and consist chiefly of an archi-
tectural frontispiece or portico richly adorned with sculpture
and other decorations. Such are those at Naqsh-Rustam;
also the tomb of Darius, the son of Hystaspes, at the foot of
Mount Racom, near the river Benarid, the ancient Araxes.
This monument has a portico of four columns, whose
capital have figures of the foreparts of animals pro-
jecting from their sides. There are also two rows of sculp-
ture above the portico.
The present inhabitants call the remains of Persepolis
itself Tak-Jamchid, or the residence of Jamachid (sup-
posed by them to have been its founder); and by the Moh-
ammedans, Tehil-Minar, or the Forty Columns, of which
number however scarcely half are now remaining. These
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Persepolis (Perepolis) is mentioned by Greek
writers after the time of Alexander as the capital of Persia.

The name however does not occur in Herodotus, Ctesias,
Xenophon, or Nebemiah, who were well acquainted with
the other principal cities of the Persian empire, and make fre-
quent mention of Susa, Babylon, and Ecbatana. Their
silence may be accounted for by the fact that Persepolis
ever appears to have been a place of residence for the
Persian kings, though we must conclude, from the account
of Arrian and other writers, that it was from the most an-
tient times regarded as the capital of the empire. The
kings of Persia appear to have been buried here or at
Pasargadz. There was at Persepolis a magnificent palace,
little beyond it a second entrance of the same kind. Like the Egyptian, these props diminish upwards, and are crowned by a cassolet, or hollow cornice: they are also adorned with fanciful colossal figures of animals, partly in low and partly in high relief, sculptured on their sides, and among these monsters are some representing winged horses with human heads, and others, propylæa. One of the propylæa led into an enclosure serving as the chief or entrance court of the palace; but that cannot now be determined, nor in what manner the principal mass of building now remaining could have been made to display itself consecutiously from such an enclosure. The propylæa were on either side of the entrance, it lies on the south or right hand of the entrance, and in such manner as to extend more westward, consequently it would have been necessary to turn back to it in that direction from any court beyond the propyla. Neither is it certain whether this office was any part of the palace itself or actual residence, or only a temple belonging to it. The plan would seem to favour the latter supposition, because, from what can now be made out from it, this structure contains within, not a spacious hall suited for entertaining, but one filled with lines of columns in every direction (as is evident from the position of those now remaining), so as to form a number of aisles intersecting each other. Such a grove-like arrangement of numerous pillars is one of the principal characteristics of Persepolis. One may, more in accordance with that of the Arabians, some of whose buildings, the mosque at Cordova for instance, are similarly filled with lines of columns. A similar dense disposition of pillars prevailed also among the Egyptians; and for an example, we may mention the Temple of Ta-Net-Her, of Pharaoh Cheops, at Gizeh, one of whose columns was at an early age to serve in his father’s army, and distinguished himself by some successes against the barbarous nations which bordered on Macedonia. His younger brother Demetrius was carried away as a hostage by the confederate Triballians at the time of Camillus’ second subjugation of them, and after remaining several years at Rome, where he won the favour of the senate, was sent back to Macedonia. After a time he was again sent by his father to Rome, on a mission, in consequence of fresh disagreements which had sprung up between the two courts. Demetrius was, however, sent back to Rome, in order to make a new arrangement of the terms of the treaty existing between his father and the senate. But he soon began to prepare himself for war, and he endeavoured to form alliances with the states of Greece, and especially with the Achæans. The senate, hearing of this, sent legates to Macedonia to examine the state of affairs. Eumenes, king of Pergamus, a staunch ally of the Romans, was also closely watching the doings of Perseus, and he even went to Rome to report to the senate the hostile preparations of the Macedonians. On his return from Italy, he was going to visit the temple of Apollo at Phila, and on his way home was murdered by assassins hired by Perseus. Eumenes escaped, and the Roman senate declared Perseus to be the enemy of Rome, b.c. 172.

The consul P. Licinius was appointed to proceed with an army to Macedonia. At the same time commissioners were sent to Greece to exhort the allies of the Romans to join in the impending struggle against Perseus. Perseus had a conference with Q. Marcus, one of the commissioners, and invited him to a truce, declaring that he might send ambassadors to Rome to plead his cause. When the commissioners returned to Rome, they boasted of having deceived Perseus by holding out the hope of peace, in order to give time to Rome to prepare for war, whilst the delay of the conference with Q. Marcus was ascribed to Perseus being ready to take the field. Some of the older senators are said to have disapproved of this conduct as more deserving of the name of Punic than of Roman faith, but the majority of the senate, who cared more for what was advantageous than

P. C., No. 1097.
for what was honest,' supported the commissioners. (Liv., xiii. 47.) The legates of Perseus, after being heard by the senate, were dismissed without any satisfactory answer. Lucanus, on arriving in Thessaly, 171 B.C., met the army of Perseus on the banks of the Peneus, but only partial engagements took place, in one of which the Roman cavalry was defeated, but in another it had the advantage, after which both armies went into winter-quarters. The following year, 170 B.C., seems to have been spent by both parties in preparations and diplomacy. The Roman senate and M. Lucanus made some attempts to enter Macedonia from Thessaly, but did not succeed. His legate Appius Claudius, being sent to Illyricum, attempted to surprise a town called Uscana, which was held by Perseus, but he was defeated, and the loss was very great. Most of his men, M. Marius, and the exactions of the Roman prators Silius and Hortensius had indisposed several of the cities of Greece against Rome, and produced a feeling favourable to Perseus. Those officers plundered Chalcis in Euboea, a town allied to Rome, and allowed the soldiers to abuse the wives and children of the citizens. A citizen of Chalcis, who came to Rome to complain, said it had been found much safer to shut the gates against the Roman prators than to receive them, for those who had shut their gates had escaped unharmed, whilst the allies of Rome were plundered. Silius and Hortensius, being sent to relieve a heavy contingent of money and corn for the army, asked for a respite, but Hortensius entered the town, beheaded the principal citizens, and sold the people as slaves. Having been sent by those unfortunate citizens, the senate ordered the Ablabii to be restored to liberty, and Lucretius, being summoned to Rome, was tried before the tribes, and fined a million of sesterces. (Liv., xiii. 4, 7, 8.) The Roman commissioners to the friendly states of the East, and their ships, which were seen in the distant appearances, but with equal dishonesty. Those states, like all weak countries that submit to the dictates of a powerful stranger under the specious name of alliance, were divided into two parties: one willing to keep on friendly terms with Rome, the other of their manners and customs, and the other servilely devoted to Rome. The leaders of the latter party sought the favour of the Roman consuls and prators by accusing those whose views were not the same as their own, of being secret enemies of Rome. Some of the persons thus accused were summoned or in other words transported to Rome, to await the pleasure of the senate.

In the next year, 169 B.C., the new consul Q. Marcus came to take the command of the army against Perseus. His army had not possessed the town of Diim, but finding it difficult to get supplies for his army, he withdrew to the frontiers of Thessaly, retaining possession however of the strong defiles of Diim, which commanded the entrance of Macedonia on that side. On this occasion, Philip of Macedon, the last of the Chersonesians, being sent by the Achaeans to offer their assistance to the consuls, remained some time with the Roman army.

In the year 160 B.C., Paulus Emilius was sent to command the army against Macedonia. He passed the mountains from Thessaly and advanced to Pylus, where he met Perseus with his army. The Romans found means to break through the Macedonian phalanx, and a skirmish was fought, which in which 20,000 Macedonians are said to have lost their lives. This single battle decided the fate of a powerful and ancient kingdom; all Macedonia submitted to the Romans. Perseus fled, almost alone, without waiting for the end of the battle. He went first to Pella, the ancient seat of the Macedonian kings, then to Amphipolis, and from there to the island of Samos, but, whose citadel was considered inviolable. Thence he attempted to escape by sea to Thrace; but a Cretan master of a vessel, after having shipped part of his treasures, sailed away, leaving the king on the shore. The king's attendants having also forsaken him, he took to the sea, with his family, and was driven out of the temple where he had taken refuge, and surrendered to the Romans. He was treated at first by Emilius with consolatory indulgence, but was obliged to parade the streets of Rome with his children, to grace the triumph of the consul. After some months, with the consent of the senate, at Alba in the mountains of the Marsi, near the lake Furmus, where he died in a few years. His son Philip also died at Alba. Another and a younger son is said to have become a scribe or writer to the municipality of Alba.

**PERSEUS (constellation).** The mythological story of Perseus is well enough known: in the heavens the constellation is surrounded by Andromeda, Ariadne, Cepheus, Auriga, Catacombe, and Cassiopeia. Of the two principal stars, Alpha (the latter is called Algol, the variable one, and is situated in the breast of the figure, the latter in the head of Medusa, which he carries in his left hand. The following are the principal stars:—

**PERSHORE.** [Worcestershire.] Persia, or Persis (Persis), called in the Old Testament Persia (Perses), and by the Arabic and Persian writers Pars, or Farsistan, is used in two significations: first, it is applied to the country originally inhabited by the Persians; and secondly, to the various countries in Asia included in the Persian empire founded by Cyrus, which included from the Indus, and from the Black Sea and the Caspian, to the Persian Gulf and the Indian Ocean.

Persia proper was bounded on the north and north-west by Media, on which it was separated by the mountain-range known to the ancients under the name of Paracosastra (Ptolem., vi. 4; Strabo, xi. 922), on the south by the Persian Gulf, on the east by Carmania, and on the west by Susiana, from which it was separated by rugged and inaccessible mountains (Strabo, x. 727). The country included within these limits is, according to Chardin's estimate, as large as France. The southern part of it near the sea-coast is a sandy plain, almost uninhabitable on account of the heat and the pestilential winds which blow from the desert of Elamistan. (Plut. xii. 28; Strabo, x. 727.) The rest of the country towards the north is intersected by numerous mountain-ranges. The soil upon these mountains is very dry and barren, and though there are some fertile valleys among them, they are generally fit only for the residence of nomadic shepherds. This part of Persia was the original seat of the conquerors of Asia, where they were inured to hardship and privation. In the inner part of the country however there are many well watered and fertile plains, in the largest of which Persopolis is situated. (Strabo, x. 727; Ptolem., vi. 4.)

The Persians were divided into several herds or tribes, of which the principal were the Persagades, Marath, and Marpi, and of these the Persagades were the noblest, to the chieftain of which, called the royal family of Persia belonged. (Herod., i. 125.) In addition to these tribes, Herodotus mentions the Phthiades, Perses, and Germani, as agricultural tribes; and the Diet, Marpi, Dorous, and Sagari, as nomadic tribes.

Herodotus (vii. 61) that the Persians were originally called Arians; which word probably contains the same root as Aria, the original name of the Medes (Herod., vi. 61); and Arta, the word by which the followers of the Babilon religion are distinguished. The root occurs in Aria and Arvan, from the latter of which the modern Persian name Iran seems to be derived. (Arvans.)

The only places of importance in Persis were Persis and Persagades, of which an account is given in separate articles.

* This star is Flamsteed's 15 according to Mr. Bevis.
PERSIA is called IRAN by the natives. The form and boundaries of the country to which this name is applied, are distinctly marked by nature. It lies between 25° and 40° N. lat. and 44° and 70° E. long., constituting an elevated table-land, surrounded by mountain-ranges, which mark the edges of the table-land, and separate it either from the sea or from the neighboring level tracts. From the northwest to the southeast, and from the west to the east, the land is higher.

On the south the table-land, or rather the ranges which enclose it, come close to the Persian Gulf and the Indian Sea. On the east of the table-land are the extensive plains which are watered by the river Sinda, or Kusus; and on the north of its extension, along which is the lake of Avar, and extends to the eastern shores of the Caspian Sea. These desert plains are known to the natives by the name of Turan. A narrow and very low tract of land separates Iran from the Caspian Sea, and a somewhat more elevated range extends from the coast of the Caspian Sea to the high range of Caucasus. Along the mountain-chains which form its western border, are the great plains drained by the Tigris and Euphrates. Thus the table-land of Iran is surrounded on all sides by lower countries, but it is connected with the mountain-ranges of Eastern Asia and Asia Minor by two chains. The chain which unites it with the Himalaya and Kuen-Luen mountains, in Eastern Asia, lies between 33° and 37° N. lat., and between 68° and 74° E. long., and is known by the name of Hind. It is across this mountain-range that the river Irak, or Tigris, runs, and extends to the eastern borders of China.

This high pinnacle a mountain-chain runs westward, and unites the table-land with the mountains of Asia Minor. This chain is called the Armenian Mountains. Along the base of the mountain-ranges enclosing it, according to a rough estimate, may occupy an area of between 1,000,000 and 1,200,000 square miles, or about one-twelfth of the surface of Asia. The table-land is generally level, interspersed with low and rocky elevations; and this plain is traversed by numerous ranges of hills, some of which are of considerable height, and are covered with forests, while others are barren and denuded of vegetation. The general dryness of the atmosphere, renders them unfit for maintaining perpetual streams of water. The ridges themselves are rocky, and frequently steep, but of incon siderable width, so that the longitudinal valleys which are enclosed by them are frequented by streams of water, which flow for times 100 miles long: such is the long valley which extends from Meshed on the south-east to Shirwan on the north-west. The declivities of the ridges are destitute of wood, except on the north side of the mountain-region, called the Ajas, where some trees occur, but they do not exhibit a vigorous growth. Though the rocky masses are generally without vegetation, some parts are covered with grass, and afford pasture during a great part of the year. The soil of the valleys, as well as the plains, consists principally of gravel and sand, and the lower banks of the rivers are generally covered with a thick growth of grass, when it has no moisture, as barren as the rock itself. No kind of cultivation is possible without careful irrigation; but as water is scarce, only a very small portion of these plains can be made to yield crops by art, while the greater part is a desert. But these plains show that a much greater portion of them was formerly under cultivation, and this change is chiefly if not entirely to be attributed to the continual predatory forays of the wandering Turkmans, who inhabit the northern plains. The valleys are as destitute of trees as the mountains, except a few poplars or chinkas (Platanus orientalis), which rise above the huts of the peasants, or the fruit-trees of the orchards, or perhaps a few other trees which have been planted on the margin of a water-course.

Whereas the Caspian Sea, the Caspian Sea and the Caspian Sea, the Caspian Sea and the Caspian Sea turn to the west, between 55° and 55° E. long., they probably occupy less than sixty miles in width, and their most elevated summits are not much higher than those of the ridges farther east. But west of 55° E. long., or west of the Caspian, they may descend gradually to the sea, and go in that direction to 52° E. long., where they again gradually decline to the north of west, until they terminate on the banks of the river Seid-rud, at the base of Rudbar. The division of the mountains is marked by a range of the Elburz Mountains, which forms a part of the mountain-system, the equilateral signs of its having once been an active volcanie. That portion of the Elburz Mountains which lies east of Mount Damavend, though considerably higher than the mountains farther east, probably nowhere exceeds 7000 or
8000 feet in height above the sea level: the snow disappears from its summits about the beginning of May. The mountainous portion of the range may occupy a width of about 15 or 20 miles, but the lower hills which skirt it on the north and south increase its breadth to 30 or 60 miles. That part of the Elburz Mountains which lies west of Mount Demavend is much higher, several of the ridges being covered with snow even in the beginning of June. It consists of three elevated ranges, which, together with two valleys, cover a space about 30 miles wide, and on both sides are skirted by a belt of hills. Between the broad belt of hills and the shores of the Caspian Sea is a narrow strip of low land, called the Plain of Mazanderan and Gilan.

The tract of country which extends along the southern side of the Elburz Mountains, and between it and the desert in the interior of Iran, may vary between 20 and 30 miles in width. In its eastern districts, where the adjacent mountains do not rise to a great height, it is supplied with water and resembles in soil and nearly every other particular the valleys of the mountain region of Khurasan; but west of 53° E., in the vicinity of Mount Demavend, where the mountains rise to a greater elevation, and are covered with snow more than half the year, numerous small rivers descend from the high mountain peaks, and flow through the valleys in which they are in a large extent cultivated. A change in the fertility of the country however occurs west of 41° E. long, where the most southern of the three ranges, composing the Elburz Mountains, does not rise so high as the others which lie farther north, and west of this point, with snow in the deep valleys most of the year, it can only feed a small number of rivers. Irrigation is consequently very limited, and an undulating, stony, barren plain generally occupies the tract between the mountains and the desert. But the two valleys, which are enclosed by the high and rugged ranges of the Shahrud, called the Shahrud of Talkin and the Shahrud of Alamût, are very well watered, carefully cultivated, and populous. Each of these valleys is about 30 miles long, and they vary in width from two to three miles. By the river Shahrud, which begins in the mountains, the Kishrud, which flows into the Sefid-rud above the pass of Rudbar, and the valley in which it flows for about 30 miles is wide and fertile. The northern declivities of the mountains are without wood.

The Elburz Mountains do not descend with a steep declivity towards the north, but are skirted by a hill tract varying from twenty to thirty miles in width. The hills sink lower as they advance farther north and approach the shore of the Caspian Sea. The valleys between them are narrow: they may more properly be called ravines, which are carried out by the torrents which descend from the range, and which, during the rains, run with tremendous force. Up to a great elevation above the sea they are covered with thick wood of oak, beech, walnut, chestnut, and oak, among which are mingled numerous herbs. The trees which are more numerous are those of the box-wood, fir, and poplar, which grows in large masses.

The eastern part of the Elburz Mountains, particularly the higher peaks, are covered with snow in the winter, and in the spring, the spring of March to May, is the most pleasant and healthy season. In summer, there is much less rain, the air contains much moisture and the plains are covered with vapour and fogs, which give rise to several kinds of fever and other dangerous diseases. The heat in summer is frequently oppressive. It is observed that a hot southerly wind sometimes springs up during the winter season, which in the spring is converted into a gentle, cool, and moist wind, and dries wood and other inflammable substances to such a degree as to render them liable to take fire from the slightest spark. It sometimes lasts only a quarter of an hour, but generally twenty-four hours, and is immediately followed by showers of rain and cold. This wind is called by the natives the Bagdad wind. It is difficult to explain how it acquires such a degree of heat and dryness, as it blows over a country covered with snow.

The climate of the eastern part of the Elburz Mountains is very mild; the distance to the Caspian Sea is a great influence, and the mountainous tracts are incomparably cooler than the plains, which are covered with snow. The valleys along the shores of the Caspian Sea are overgrown with salina plants and cotton, which are extensively employed in building and for domestic purposes. At a short distance from the shores begin the forests, which cover the whole plain, and extend to a considerable elevation up the slopes of the hills. These forests contain numerous trees which are used for building, and adorned with extensive orchards and plantations of mulberry-trees and rice-fields, rice being the only grain which is cultivated. The vines frequently occupy large spaces, as well as the orchards, which produce figs, pears, peaches, cherries, sweet almonds, pomegranates, melons, and other fruits. The climate grows wild. It is however observed that in the lower and western portion of the plain which constitutes the province of Gilan, the sugar-cane and orange-trees, which abound in Mazanderan, do not succeed, and are only cultivated as ornamental plants; cotton also does not grow, and the fruits have an acid and harsh taste. The sugar-plantations in Mazanderan are very extensive, and cotton is one of the principal objects of cultivation: in Gilan the peasants are mostly occupied with the raising of cotton, and the plain is almost continually covered with cotton fields. The cotton, however, is somewhat more elevated than that of Gilan, and the climate less humid, which evidently arises from the smaller elevation of the Elburz mountains at the back of Mazanderan, and at the back of Gilan, and the greater breadth of the plain.

The western portion of the plain of Gilian separates the Caspian Sea from the table-land of Azerbaijan, which constitutes the most northern portion of the great table-land of the Caspian Sea, and is the only portion of it situated between 44° and 49° E. long. A small portion of it, north of the river Aras, belongs to Russia. The general elevation of this table-land is 4500 feet above the sea-level, and perhaps nowhere sinks lower, though in many parts it rises higher, and in some parts to a height of 5000 feet. The plain is somewhat more elevated than the former, and extends a mountain-range, which begins on the banks of the Sefid-rud, opposite the termination of the Elburz Mountains at the pass of Rudbar, and extends nearly parallel to the shores of the Caspian Sea in a north-west and northern direction to the banks of the Aras, where it ter-
minutes not far from that river on the boundary-line between Russia and Persia. This range, which is uninterrupted, is about 150 miles long, and is called the Massula Mountains. It rises from 6000 to 7000 feet above the sea-level, or about 2000 feet above the table-land. To the west of it, and at a distance varying from 6 to 30 miles, lies the mountainous coast of Persia, about 30° N. lat., and approaches higher range, which, even at the mountain-passes, exceeds 8000 feet of elevation; and in Mount Sevellan (north of 35° N. lat.) rises to about 12,000 feet; but this range is broken by the river Seh-rud below Miana, and does not exist for 100 miles. Mount Sevellan is subject to heavy rains, and its slopes are covered with stunted forests. Azerbaijan is bounded on the west by the numerous ranges of the Kurdish mountains. The surface of the table-land in general is hilly, but the hills do not rise into mountains, except between 36° 30' and 37° 30' N. lat., where several high ranges occur, as the mountains of Kibeh and the Kalifan Koh, which perhaps rise to 2000 feet above their base. This tract seems to contain the highest portion of the table-land, and the ranges of hills form a connection between the Kurdish mountains and the Massula mountains. The levels between these ranges are not in general extensive enough to be called plains, though in some parts they are several miles wide. But farther north, several of them from extensive plains, among which that surrounding the lake of Urumiyeh is by far the largest. Though in some parts, the plains are nearly all the land, including only the hills which terminate at a small distance from the shores of the lake, the plain extends in general from 20 to 30 miles from it, and at Tabriz even 50 miles. From the hills and mountains which enclose the basin of the lake an immense number of pastures and new pastures are opened for cultivation. The rice-fields are extensive, and produce rich crops: the meadows are equally large, and horses, buffaloes, cows, sheep and sheep are abundant on the pasture-grounds. But the greatest wealth of the plain consists in its large orchards, which yield abundance of peaches, nectarines, apricots, plums of all sorts, cherries, pears, apples, and grapes. There also are plantations of poplar and cinna, but the mountains and hills are generally devoid of wood. In the Rud-Dagh, near Tabriz, the 17th century father have not the advantage of abundant water, the cultivation is limited, and they are chiefly used as pasture-grounds by the nomadic tribes. The climate of this table-land is cold in winter, but very temperate in summer. During several of the winter months it is covered with snow, and the cold is sometimes very intense, except on the plain around lake Urumiyeh, where the winters seem not to differ much from those of Northern Italy. The royal family of Persia abandon the town of Teheran in summer, and retire to Sultanian, in the mountains. The mountains of Kurdistan occupy a broad belt of country along the western edge of the table-land of Iran. Mount Ararat may be considered as standing at the northern extremity of the mountains of Kurdistan. Its summit is 17,320 feet above sea-level, and it is the highest mountain in western Asia, or to the west of the Hindoo-Cooch. The plain which extends along its northern base, and which attains an elevation of about 5500 feet above the sea level, separates it from the mountains which enclose the Black Sea on the south and east. From its southern base mountains branch off to the south and south-west, which enclose the lake of Van, and extend considerably in width, so that near 35° N. lat., the whole country between the plains of Urumiyeh and the south-eastern coast is a fertile region where it is crossed by the rivers couples. The principal range extends from the lake in a south-eastern direction, but does not seem to decrease in width until it approaches 36° N. lat., where it is probably not much more than 100 miles wide. Farther south it grows still narrower, and south of 37° it is hardly more than 70 or 80 miles wide, a breadth which it preserves to its termination, which may be fixed in 38° N. lat., where the mountains of Farsistan begin. The last-mentioned range may be considered as the continuation of the mountains of Kurdistan. The northern portion of the mountains of Van, and south of 35° N. lat., is nominally subject to the Turkish emperor; but the nomadic tribes which inhabit it are independent under their hereditary chiefs, who frequently make predatory excursions into the neighbouring countries. This portion, however, the exceptions, is visited by European travellers. It seems that the whole is almost entirely occupied by mountain-ranges, and that the valleys which are narrow are characterized by the excellent pasture-grounds on the declivities of the mountains. Some summits appear to attain a great elevation, especially Mount Jawar, near 37° N. lat., nearly in the centre of the region. That portion of the Kurdish mountains which lies south of 35° N. lat., and which is the last to be left in the possession of our countrymen. The central portion of this region consists of a succession of mountains and narrow valleys, but towards its eastern and western edges there are wide valleys, or rather plains, a part of which is under cultivation, though the larger portion is generally used as pasture-ground. The mountains differ from those which surround the table-land of Iran, especially in their declivities being wooded with oak, which, near the base of the mountains, grows to a large tree, but higher up is stunted. The plains and valleys of this region probably occupy the summit of the table-land. The ridges, frequently four, five, or even six in number, run in the direction of the whole range, and are frequently united by transverse ridges. But there are also several valleys which run across the ranges, as is evident from the courses of the rivers; but which join it only near the border of the 35° N. lat., and traverse this mountain region, do not rise within the range, but to the east of it, on the plains of the table-land of Iran, such as great Zab, the Dijlah, and the Kharkh. Though several summits and ridges attain a great elevation, and are used for winter pastures, but snow, only two summits rise above the snow-line: one of them is situated on the most western ridge, called Kab Koh, near 33° 15' N. lat., and the other in the ridge, called Keb Koh, near 32° 30' N. lat. That part of the great plain traversed by the Euphrates and Tigris, which belongs to Persia, lies between the mountains of Kurdistan, and the banks of the Tigris and Shat-el Arab. It is about 100 miles long, and, on an average, 30 miles wide. Towards the north the plain is shrubbery, and great river, and comprehends nearly one-half of the country, is swampy and uninhabited, owing to the badness of the air, and the difficulty of draining the ground. About fifteen miles from the banks of the river, the country is considerably higher, but as the soil is composed of sand and partly of a hard clay, it cannot be cultivated, except along the banks of the rivers, and even there cultivation is very limited. The greater part of the country is a waste, which does not yield pasture, except for camels. This more elevated tract is called the desert. The country which lies east of the Kurdish mountains, and between them and the Koweer, or Salt Desert, belongs to the table-land of Iran. Its general elevation is so high as to be in the southern districts exceeds 4000 feet, and rises in some parts to above 5000 feet; but near the Caspian, where it sinks down to 2500 feet, and in some places even lower. It is a plain traversed by numerous ridges of rocky hills, which generally run from west to east, and sink gradually into the desert farther east. Few of these hills are more than 1000 feet above their base, and generally not half so much. The valleys are open and wide, in some parts exceeding ten or fifteen miles in width; they are also very long. Here, too, as in most places on the table-land of Iran, cultivation is very limited. The soil is poor, and the eastern part of the Kurdish mountains does not rise high enough to be covered with snow for many months, the rivers which descend from them are scarcely provided with water during a great part of the year; and the little that they furnish is absorbed in evaporation. The farming, being for the most part uncultivated, except in the vicinity of the villages, and these villages only occur at great distances from one another. It is however certain that a much greater portion of these valleys was formerly under cultivation, and that the decrease of agriculture in these districts must be attributed to an oppressive government and the incursions of the nomadic tribes which are in possession of the mountains of Kurdistan. The mountain region of Farsistan and Kerman occupies the whole of Persia south of 30° N. lat., from the mouth of the river Tab to Cape Jask (from 50° to 58° E. long.), a distance nearly 500 miles in length, and nearly 200 miles in average
width. On the south it is washed by the Persian Gulf, and on the north it borders on that part of the great desert which is called the desert of Kerman. Along the shores of the gulf is a low and sandy tract, varying in width from 20 to 30 miles, the soil of which is impregnated with salt. It has a very hot dry climate, and produces nothing but dates. The natives call it Dushistan or Gurmīr, that is, the warm region, and look upon it as the desert of Kerman. Whbir is a navigable, even for small boats, more than a few miles inland. It is asserted that the Gurmīr is slowly increasing in width by the retreating of the sea. At the back of this low tract the country rises in steep and bare rocks to the height of mountains, and from 20 to 40 miles inland. The sea and the valleys enclosed by the ridges produce the date. The ridges, though generally of considerable width, are numerous, and the valleys are narrow, except towards the north, where they are from 15 to 20 miles across. The mountains are barren and desolate, but the plain of Gurmīr is rich in water and even grain, where they can be irrigated. The plain which extends along the northern side of the mountain region, and which is from 60 to 100 miles in width, has a soil strongly impregnated with salt, and contains several smaller salt lakes besides the large salt lake of Whitehaven. It forms a portion of the great desert, if it were not divided from it by a nearly continuous series of oases, which stretch east and west through it, between 29° and 30° N. lat., and which are enclosed on the north and south by two low ridges of salt hills. This narrow salt desert, called the Nurmanshīr, produces some grain, but it is particularly rich in several kinds of fruit, which attain great perfection.

Having surveyed the countries which surround the Great Desert of Iran on the north, west, and south, we shall notice the desert itself, as far as it is included within the boundary of Persia. The desert has its greatest width on the eastern border of Persia. Between the Nurmanshīr and the town of Herat it is more than 350 miles across. Pottinger says that there are countless thousands of camels which between 60° and 62° E. long. form an extensive migration, which advances as far as 31° N. lat., a narrow though at intervals very lofty ridge branches off in a northern direction, and extends, between 39° and 60° E. long., far to the westward of Herat. This narrow desert tract, called the Sefīd-rud or White River, runs about 80 miles, draining the valley between the two ranges of the Massūm mountains. When it approaches the western extremity of the Elburz range, it is joined from the east by the river Shabrud, which drains the valley in the western portion of the Elburz mountains, and runs about 100 miles. After its junction with this river, the Sefīd-rud flows for about 30 miles in the narrow valley which separates the Elburz mountains from the eastern Massūm range, and enters the plain of Gilmān, through which it flows to the Caspian Sea, and at its mouth may be about 350 miles. On the table-land of Azerbaidjan the bed is generally many hundred feet, and sometimes a thousand feet, below the adjacent country. Thus it cannot be used in the manner of a river. The banks are less elevated above the pass of Rudbar, still less, and can only be used to fertilise the country. In the plain of Gilmān the current is not rapid, but it is not navigated, being of little importance in its banks, which are very low and swampy. Two rivers, each running about 100 miles, fall into the lake of Urmūsh, the Aji, which runs about 100 miles north of Tabriz, and the Laghūsh, which falls into the lake not far from the most southern-east. Both are extensively used to irrigate the valleys through which they flow, and form a portion of the rivers which drain the mountains of Kurdistān and its numerous valleys are not navigable within the mountains, as their course is frequently broken by rapids and cataracts; and where they enter the plain, they are not navigated, the abundance of the rain and snow, as well as the ad- jacent mountains, prevent their being used. These rivers run between 200 and 400 miles: the Daŷdūsláh, which joins the Tigris below Bagdad; the Kerḥab, which falls into the Shat al Arab a few miles below Korneh; and the Karun or Kurān, which joins the same river at the point where it begins to divide into numerous branches.

As a great part of the soil of Persia is impregnated with salt, the few lakes which occur are salt also, except in the province of Mazenderān, where there are several small lakes of fresh water. The most considerable of the lakes of Persia is that of Urmūsh or Shaloo (called Spavas

River and Lakes. — The table-land of Iran, together with the mountain regions which surround it on the north and south, is very wady. The drainage ranges are too bare and also low to attract sufficient moisture to form perennial streams, except in a few places. The northern mountains give rise to a much greater number of watercourses; but the river of the plain, and sometimes before, the small volume of water which they bring down during the greater part of the year is absorbed in irrigation, and only a few of these streams reach the desert, where they are lost in the dry and thirsty soil. The rivers of the mountainous regions in the south are the Seffīd-rud, which is called Kヘルmand or Östen. It rises within the mountains of Kurdistān, south of 35° N. lat., and turns to the east and then south, along the table-land of Azerbaidjan; it runs by a very circuitous course, first east-north-east for about 100 miles, and then about the same distance northward; when near 37° 20' N. lat., it breaks through the western chain of the mountains of Massūm and turns to the north-east, running through a plain of about 80 miles, draining the valley between the two ranges of the Massūm mountains. When it approaches the western extremity of the Elburz range, it is joined from the east by the river Shabrud, which drains the valley in the western portion of the Elburz mountains, and runs about 100 miles. After its junction with this river, the Seffīd-rud flows for about 30 miles in the narrow valley which separates the Elburz mountains from the eastern Massūm range, and enters the plain of Gilmān, through which it flows to the Caspian Sea. It may be about 350 miles. On the table-land of Azerbaidjan the bed is generally many hundred feet, and sometimes a thousand feet, below the adjacent country. Thus it cannot be used in the manner of a river. The banks are less elevated above the pass of Rudbar, still less, and can only be used to fertilise the country. In the plain of Gilmān the current is not rapid, but it is not navigated, being of little importance in its banks, which are very low and swampy. Two rivers, each running about 100 miles, fall into the lake of Urmūsh, the Aji, which runs about 100 miles north of Tabriz, and the Laghūsh, which falls into the lake not far from the most southern-east. Both are extensively used to irrigate the valleys through which they flow, and form a portion of the rivers which drain the mountains of Kurdistān and its numerous valleys are not navigable within the mountains, as their course is frequently broken by rapids and cataracts; and where they enter the plain, they are not navigated, the abundance of the rain and snow, as well as the adjacent mountains, prevent their being used. These rivers run between 200 and 400 miles: the Daŷdūsláh, which joins the Tigris below Bagdad; the Kerḥab, which falls into the Shat al Arab a few miles below Korneh; and the Karun or Kurān, which joins the same river at the point where it begins to divide into numerous branches.

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by Strabo), which is more than 80 miles long, and about a third of that distance in extreme breadth. The greatest depth of the water is four fathoms, and the average depth about one fathom. Shores shelf so gradually, that this depth is rarely attained within two miles of the land. The water is much saltier than that of the ocean. It is stated that its specific gravity is 1.163, while that of the Atlantic near the equator is 1.085, and that of the Pacific 1.021. It contains no fish, but the smaller classes of zoophytes are plentiful. The lake is nearly circular in form, and exhibits a considerable number of 'rivers', some of which are considerable, as the Aji and Teghati, but it has no outlet. The mountain region of Farsistan contains the salt lake formerly called Bakhtigan, but now Dory-l-i-Niriz, or the Lake of Niriz. This lake has no outlet, and the shores are without vegetation and uninhabited. [BAKHTEGAN]

Climate.—The climate of the plain of Ghilan and Mazanderan has already been described. That of the Gurmser, or the low and sandy tract along the Persian Gulf, is distinguished by heat and dryness, and is the country most suitable to the growth of date-trees, which only bear edible fruit where these two circumstances concur. It is extremely unhealthy during the summer heat, and is then almost entirely abandoned by the inhabitants, who retire to the mountains where they are safe from cholera. The tabule land is very hot in summer, but cold in winter. In summer however the air is dry and the sky cloudless. In winter it is not so dry, and a good deal of snow falls; and many of the valleys are covered with snow which does not melt during the summer. The soil is very fertile, especially where the vegetation can be supported by irrigation; while the central part of the table-land is a desert, and the oases within this desert are more fit for plantations of fruit-trees than for the cultivation of grains. The climate of the mountains of the Caspian Sea is quite different. The mountains are covered with snow and glaciers; the snow begins to fall at the end of November and lasts until the end of May. The climate of Teheran during the summer is subject to sudden though not great changes, which may probably be ascribed to the vicinity of the mountains. The climate is much more regular and constant in the other mountain regions.

Production.—Agriculture is well understood and carefully attended to, as is evident from the means of irrigation employed, and especially the subterraneous aqueducts. But extensive tracts, which were formerly under cultivation, are now barren. Weeds grow between the rice, weeds, and salt, and the end of November. Other tracts, which are cultivable, grain is not raised, but they are kept in their natural state as pasture-ground for the llivats, or wandering tribes who live within the borders of the desert. These fruits are apricots, peaches, nectarines, plums, apples, pears, quinces, figs, pomegranates, mulberries, currants, cherries, almonds, walnuts, and pachichod. The vine is very scarce, and even then the wine is only collected in a few places by the Christians. The melons of Persia are distinguished by their size and flavour. The chief culinary vegetables are turnips, carrots, cabbages, lettuces, cauliflowers, radishes, celery, onions, garlic, parsley, and fennel. The poppy seed is indigenous to the northern declivity of the Elburz mountains. The oak, which covers large tracts of the mountains of Kartistan, does not grow to the size of a timber-tree. One of the most remarkable vegetable productions of Persia is the plant from which opium is derived. The poppy which produces opium is cultivated all over the table-land, and in many places saffron also is cultivated.

The domestic animals of Persia are camels, horses, asses, mules, black cattle, buffaloes, sheep, and goats. There are three sorts of sheep, or 'goats': those with one hump, those with two, and a third produced by the union of these varieties; the last are preferred on account of their strength, docility, and patience. They carry from 700 to 1100 lbs. English. The Persian horses are noted for their beauty, and especially those of the Trotz breed. The race has been much improved by crossing with Arabian horses. It is hardly possible to conceive what journeys they are able to perform. The finest horses will fetch from 300l. to 400l. Even the common horses are good and strong, and are reared in a kind of curious manner. Trotz are a cross between thoroughbred stallions and a breed of ordinary strength and endurance. Asses are numerous, and some of them of superior size and description. Mules are used for the transport of goods more than any other animals; they are the only beasts profits and usually employed for this purpose. The black cattle of the plain of Mazanderan are distinguished by size and beauty, and they have the Indian hump. Sheep are very numerous in all the parts possessed by the nomadic tribes: they are principally of the coarsest kind.

Though Persia, owing to the want of forests and the barrenness of the soil, is not largely stocked with wild animals, there is a great variety in the different parts. The lion is found on the plains along the Figs, in Farsistan, and some other parts. The lynx, the tigress, the tigress, and the lynx, and the lynx, and the lynx, and the lynx, and the lynx. The black cat of the plain of Mazanderan is distinguished by size and beauty, and they have the Indian hump. Sheep are very numerous in all the parts possessed by the nomadic tribes: they are principally of the coarsest kind.

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Inhabitants.—The population of Persia is differently estimated. Some think that it hardly exceeds seven millions, but others increase it to fifteen millions. It consists of a great number of nations, who speak different languages; but all of them belong to the Caucasian race. Many of these nations still adhere to a wandering life; it is even said that one-fourth of the population consists of nomadic communities, who form almost a distinct class from the nature of their pursuits and the peculiarities of their mode of living.

That portion of the population which has fixed abodes consists of Persians and Parsees, of Armenians and Arabs.

The Persians, who are distinguished among the nations of Western Asia by the politeness of their manners and the degree of scientific knowledge which they have acquired, constitute the bulk of the population, and are merchants, agriculturists, and manufacturers. The number of the Parsees is less, and their influence is less, but they are numerous only in the cities of Yazd. Their language differs considerably from that of the Persians; they are not Mohammedans, but adhere to the religion of Zoroaster, as it is contained in the Zend Avesta, and adore fire as the symbol of the divinity. They are distinguished by the purity of their life and their honesty in all transactions, and occupy themselves mostly with agriculture and the raising of crops. Many of these fire-worshippers, when persecuted by the Mohammedans after the co-existence of their country by the Caliph Omar (A.D. 642). The Parsees have been emigrated in other lands, and communities still exist at Surat and Bombay. In India they are merchants, and highly esteemed for their honesty. The Armenians live in all the great towns, where they are merchants: they also cultivate the ground, and are particularly noted for the cultivation of the tobacco of Azerbaijan, where they exclusively occupy whole villages, and have obtained the esteem of the Mohammedans by their industry in agricultural pursuits. Armenians form the bulk of the population in Buskistan or Varsar, where they gain their livelihood as fishermen, seamen, planters of date-trees and merchants.

The wandering tribes of Persia are comprehended under the general term of Ilugate or Ilut, and are found in every part of the country. They are inhabited by immense numbers of cities and villages. These tribes are accordingly divided into Shehr-nishin, or dwellers in cities, and Sahra-nishin, or dwellers in the field. A considerable number of them adhere to their original mode of life, and live all the year round in tents, in the winter keeping to the plains, and in the summer seeking the pastures of the mountains. The wealth of the Sahra-nishin consists in cattle. They breed camels and horses for sale, and their sheep yield milk, which is made into raughan (liquid butter), and sold throughout the country. The most precious privilege enjoyed by these tribes is the range over districts from which no one can exclude them. In the summer they ascend to high mountain-plains and the deserts of the mountain-ranges, where they find abundant pasture, which is called ghulich, and in the winter they keep to their kishichik, or tracts of land belonging to their clan-like propensities. They feed principally on the produce of their flocks, and eat sour milk, cheese, dough, or butter-milk, and much raughan. Some of these tribes have the most extensive of all the large tracts in the provinces, consisting of a great number of individuals. The most numerous are the Luras, who inhabit that portion of the mountains of Kurdistan which lies south of 34° N. lat., and comprehends the province of Luristan, together with the mountainous part of Persia, and extends over mountains of Khuzistan. They consist of 34,000 families. To the east of the Deshat are the Luras, who are called Luras, and extends over the mountains of Khuzistan. They consist of 28,000 families. A small number of these tribes are Shehr-nishin, but their country consists of towns and villages inhabited by persons who do not belong to these tribes. The language of the Luras differs slightly from that of the Kurds, in the province of Kermanshah, and a person conversant with one dialect can perfectly understand the other. Major Rawlinson is inclined to regard both dialects as derived from the old Farsi, the Farsi Kadim, as it is called. The mountains west of the river Kerkhah are in possession of some Kurdish tribes, among which the Garu, Mikir, and Rewendi are the most numerous: the two last-mentioned tribes contain about 12,000 families each. Many of them, especially the Mikir, have almost entirely abandoned their wandering habits, and cultivate the ground. There is also a large tract of the mountain-region of Khorasan, on the northern border of the table land of Iran. They do not originally belong to that country, but, according to Morier, were transplanted thither by Shah Ismail, in order to protect the boundaries against the predatory incursions of the Turkomans, who inhabit the desert plains of Turkestan, and who frequently entered Iran by the large break which occurs in this part of the mountain-range. Only 4000 families were originally settled in this district by Shah Ismail, and they became numerous only by the agency of the Persians, who effectually protect the frontier, but have themselves become robbers, and frequently lay waste the neighbouring valleys and plains, and raise the standard of rebellion against the sovereign of Persia. They are governed by five chiefs, who are the khans of Kuchistan, and are the most powerful. He has from 25,000 to 30,000 families under him, of which number two-thirds are Salir-nishin. They have preserved their language, which also resembles the old Farsi, but have adopted the dress of the Persians. To the north of Deshat, and to the east of Herat, there is a tribe of Arabs, which was transported to this country from Nejd by Shah Ismail, for the same purpose. They originally consisted of 2000 to 3000 tents, but have increased to about 6000 tents. They retain the manners of the Arabs, and are called the Salar-nishin, or dwellers in the field. They are of the Sunni sect, and partly preserve their language, though they have changed their national costume.

Besides these tribes, which almost exclusively occupy the plains of Persia, there are others which are dispersed over other parts, but constitute only a small portion of the population. They are all of Turkish origin, with the exception of the Lur, or Lek, who are considered Persians, and whose number is not very considerable. Their principal settlements are about Caspin, and in the provinces of Fars and Mazanderan. Their total numbers are reckoned at about 20,000 houses, and they live partly in cities and partly in the plain. Among the Turkish tribes, the most remarkable is that of the Shab. The ordinary name of this people is Nadir Shah, spring, number altogether about 30,000 houses, and are dispersed over Irak Ajeni and Khurasan. They principally reside in towns. The most numerous of the Turkish tribes are the Shekagi and the Shab-seven, whose range of country, which extends from the Luras and the Khurasan, consists of about 50,000 houses, and from it the greatest number of the Persian foot-soldiers are drawn. The Shab-seven are calculated at 20,000 families, and make excellent soldiers. They live mostly in tents, and speak Turkish.

Political Divisions, Provinces, and Towns.—Persia is divided into several governments, whose limits however are frequently changed, and according to geographical preservation are to be found in the eastern range of the Kurdistan Mountains. The interior of Persia is occupied by the large provinces of Irak Ajeni and Khurasan; and along the shores of the Caspian Sea extend the provinces of Gilan, Mazanderan, and Astarab.

1. Azerbaijan. [Azerbaijan.]

2. Kurdistan comprehends the mountain region of the Kurdish range between 36° and 34° N. lat., about the sources of the rivers Sepid-rud, Dijalah, and Kirkhah; it is separated from the Pashah of Bagdat on the north, by the eastern range of the Kurdistan Mountains, called the Shahu Mountains, and farther south chiefly by the course of the river Shirwan, a branch of the Dijalah. It is mainly
separated from Persia by the river Kebrah. It is divided into two parts; the north-eastern part, called Ardelan, is subject to a Turkish chief, and the south-western, called Kermanshah, principally belongs to Persia. The first part, comprising the country surrounding the upper branches of the Sefid-rud, which is about one-third of the province, consists of a succession of well-watered places, with villages and valleys, and has excellent pasture-grounds. It contains Sehnah, the residence of the Turkish chief, who lives in a sumptuous palace, built on a small hill in the middle of the town. The second town is about 20 miles from the first, and contains 5000 families, among which 200 are Jews, and 50 Chaldians Christians of the Catholic communion. Kermanshah also is principally mountainous, but there are fine wide open valleys along the rivers Shirwan and Kebrah, and pretty extensive plains, which are watered partly by rivers and partly by wells, and are well cultivated. Kermanshah, the capital, a flourishing town, is situated in the southern extremity of a fine plain, through the centre of which runs the Karasu, an affluent of the Kebrah. It contains about 12,000 houses, and has many public buildings. It carries on a considerable commerce, being on the great caravan road which passes across the mountains between Bagdad and Hamadan, Isfahan, and Teheran. This road is the most direct, and the greatest part of it is without the least great antiquity occurring along. About six miles from Kermanshah, on the face of the mountains which enclose the plain on the north, are excavations and sculptures of great extent, called Takt-i-Bostan. Where this range of mountains meets the plain of Mal Alam, or the plain of Kermanshah, are the sculptures of Besittoon. [Besittoon.] About 30 miles farther east, also near the road, there are extensive ruins, among which those of a temple of Artemis are the best preserved. They occur near a village called Echeta, about 30 miles west-south-west of Hamadan. [Echeta.] 3. Lursian, which lies between the Kerkhir and the Dizful, an affluent of the Kuran, is entirely occupied by mountains and narrow valleys, except some places of natural beauty on the higher ridges of the mountains. There are 1000 families alone under cultivation, the remainder serving only as pasture ground to the different tribes of Lurs who inhabit it. In the centre of the mountains is an extensive track of 70 or 80 miles in length, in which no human dwelling is met with, and which is traversed in its length by the road leading from Dizful in the province of Khusian to Khormo-abad. There is no town in this province, except Khormo-abad, which stands in a fertile and tolerably extensive tract of three miles square, between the mountains and desert. The town contains about 1000 houses, and is built on the south-western face of a steep rock, on which a strong fortress and palace are erected. 4. Khorassan comprehends the southern part of the mountainous district of the plain of the Tigres which belongs to Persia. It is therefore naturally divided into two portions. The plain, which is in possession of some Arab tribes, contains good pasturage in the northern and eastern part, but contains but a slight portion of cultivable land, which produces but a small quantity of provisions. The southern part of the country, Ras (Cape) Berdistan, is occupied by Arabs, who acknowledge the authority of the iman of Muscat; and in the northern districts there are some tribes of Kurds. In that part of the coast which is subject to the Persians, near Cape Berdistan, the town of Kazerun is stated to have 6000 inhabitants, and some trade is carried on with Bassora, Muscat, and the different towns on the Persian and Arabic coasts. Near it is an excellent roadstead, where a frigate may lie at anchor when there is trade with either Bassora or Muscat. Kazerun is situated on the present boundary-line of Khorasen, is situated on a very mountainous tract, but contains but a small portion of cultivable land: it is about three miles in circumference, and contains nearly 10,000 inhabitants. The mountains between this place and Shiraz are nearly uninhabited. Kazerun, in a valley 30 miles long and seven or eight miles wide, was once a considerable place, but has been in decay for the last 50 years. In 1809 it contained 3000 or 4000 inhabitants. Shiraz, Vol. XVII. — 3 P
The capital of the province, and for some time the residence of the kings of Persia, stands in a fertile plain, surrounded by extensive gardens. It is six miles in circumference, but a greater part of the area is covered with ruins. The houses are generally small, and the streets narrow and filthy. None of the edifices are remarkable for antiquity or beauty, except the great Bazar, or Bazaar-i-Wiskel, which is a magnificent arcade nearly half a mile long and perhaps forty feet wide. It is said that the rocks of which it is built are the same and that the sun and rain burn through the top, with numerous skylights, which, with the doors and windows, always admit sufficient light and air, whilst the stones and rain are completely excluded. It affords accommodation to several hundred travellers, and they are inured to the town on the road to Shiraz with Yezd, Isphahan, and Bushire. Through Bushire it receives goods brought from India and Europe, which it exports to Yezd and Isphahan, receiving in return the manufactures of those two cities. The population is variously stated to be 40,000 and 60,000. This place contains several manufactories of cotton, glass, iron, and gunpowder. The horses are made of steel brought from India, from the town of Lahore, and much prized, though less so than those of Khorasan and Kerman. The glass houses are very extensive, and the silk and cotton are exported to all parts of Persia. The wine, made by the Armenians who are settled in this town, is thought to be equal to any in Asia. Shiraz is also famous for its roses and the rose oil which is obtained from them. Near the town at the foot of the tomb of the emir Firoz-abad, a town situated in a fertile plain, contains about 4000 or 5000 inhabitants. Darabghird, a town containing from 15,000 to 20,000 inhabitants, is surrounded with groves of orange and lemon trees, and the juice of their fruit is considered as one of the most delicious articles of commerce of other parts of Persia. The tobacco cultivated here and at several other places in the neighbourhood is the best in Persia, and perhaps in the world. It is sent to distant places. North of this place is the pass of Urmanj, which leads to Robat in Kerman, and runs for two miles between perpendicular mountains.

In no part of Persia is the number of ruins so great as in Parsistan. The most remarkable are those of Persepolis [PERSEPOLIS], which are situated north-east of Shiraz, at a small place called at 40,000 and 60,000. This place contains a town six miles in circumference, amidst rocks and precipices, many of which are decorated with sculptures similar to those near Persepolis. A statue from 15 to 20 feet high, now mutilated, is said to have been dedicated to Cyrus the Great. [PARASPARGE.] Near the great ruins of Persepolis are the Naiksh-i-Roostan and the Naiksh-i-Rejib, both of which are considered to be the tombs of kings of the Sassanian dynasty. Very extensive ruins in the neighbourhood occupy a large space in the plain, about 17 miles in length and half that distance in width, but have not been examined by European travellers. Other ruins of some extent occur in the neighbourhood of Darabghird, and in several other places.

6. Laristan occupies the country between Cape Berdistan and the island of Kish, and consists of the Dushtistan, or the low tract along the sea, and a hilly country. The low coast is in possession of the Arabs, which is now in a state of complete desolation. The hilly country, which is about 100 miles in width, is sterile along the low plain, but it contains a greater number of fine valleys, which produce dates and other fruits, and also grain. But as this country has seldom been visited by European travellers, we are very imperfectly acquainted with its capabilities. There are several small harbours on the Persian Gulf. The capital, Lar, is at the foot of a range of hills, in an extensive plain, which is covered with palm-trees. It contains about 12,000 inhabitants, and is celebrated for the manufacture of swords, muskets, and cotton cloth. The bazaar is the noblest structure of that kind in Persia. It is built in the same manner as that of Shiraz, but on a much grander scale, the arches being more lofty, the breadth greater, and the length longer. The houses are of mud and straw. The only water used is from large cisterns, in which it is collected during the wet season. Larun, east-north-east of Lar, is a large and populous town; but mainly built it carries on a considerable commerce with Muscat, Gombroon, and Shiraz.

7. Kerman occupies the south-eastern part of Persia, extending along the Persian Gulf from Cape Jark to a point opposite the island of Kisham, and thence northward to the borders of the desert, of which the adjacent southern part is considered as included in this province, and called the desert of Kerman. The desert is sandy and impassable in many places, but it is possible to sail within forty miles of it and at times to cross it. It is stony and flat, with numerous salt marshes, and the deserts close up to the sea, where they form a lofty coast. The short valleys in these mountains are well watered, afford pasturage for the whole year round, and contain fine plantations of date and other fruit trees. This is particularly the case where the coast runs south and north between the small town of Serekh and the large town of Minab or Minaw. Between these two places the mountains are rugged, and thick forest is formed which is very fertile; it is termed by the natives the Paradise of Persia. It abounds in every kind of fruit. The mountains then run northward, and form as it were a wall of rock, rising more than 50 miles from the sea, and then descending to its level, as at Gombroon, or Shiraz. The plain thus formed rather resembles the sandy tract called Garmir, because of its height and extent, and the mountain is sometimes called the Parvaneh, or the Great Bazar, which is extensive and well built, is abundantly supplied with articles of every description; and there are nine large caravanserais within the walls, and a number of inferior ones both within and without it. Serekh is a small town subject to the town of Kerman, and the harbour of Gombroon. In estimating these two towns, there is said to be a large place called Sultanabad. [GOMBROON.] Of Minab nothing is stated but that it is a large place with very commodious houses.

Opposite to the town of Gombroon, and about 9 miles from it, is the island of Kisham, the largest in the Persian Gulf. It is 60 miles long, but the width does not exceed 12 miles. It is separated from the mainland by a narrow channel, which is very rocky, and covered with sand-banks. It is stated that Kisham once contained upwards of 200 villages and towns, but they have been reduced to half that number. The inhabitants live by fishing and agriculture. The island produces dates, wheat, and vegetables, with a few grapes. There are two towns, Kisham, at the southern extremity, with 2000 inhabitants, and Lafi, on the northern side. At Bassadura, at the western extremity of the island, the East India Com-
any had an establishment some years ago. Not far from Kishm is Hormuz. [Omanus.]

8. Khorsan, or Khurassan, extends over a large part of the Great Desert, and over nearly the whole of the mountainous region which lies north of it. According to the Persian geographers, it once comprised the whole of northern Persia as far as the neighbourhood of the Indus, and consequently the whole of the south of the country now subject to the king of Afghanistan. A short distance to the east lies Téheran, and a little farther to the north, the small town of Sebegus, in the extreme north of the desert which lies between Herat and Yazd, numerous oases occur; most of them are small, but some are of considerable extent, and contain large towns. Among these towns are Gunababad with 30,000 inhabitants, Bushrewqshah with 20,000 inhabitants, and Tabush with a still larger population. Our information respecting these places has indeed only been obtained from natives, whose statements have usually been found to be very incorrect and exaggerated. But the wide valleys which lie along the desert have facilities that form the descent from the table-land or range to the low sandy plains of Turan, must possess a considerable degree of fertility, as there are several large towns here, and the villages are numerous and populous, in spite of the frequent sandstorms being scattered. These towns are settled in a wide and very fertile valley which extends from the town of Mushed in a north-western direction for more than 100 miles, for the purpose of protecting the country against the invasion of the Turkomans, but they frequently fill the form of small oases. A very fertile valley. A small river runs through this valley, and the only points of access occur where the stream leaves it; and even these are fortified by towers and walls, which are considered impregnable. The valley is well cultivated, and contains 2000 families in twenty villages.

9. Irak Ajemi, the largest of the provinces of Persia, comprehends a considerable portion of the Great Desert and the countries which enclose its north-western extremity on the west and north, and which in their different parts display a great variety of natural features. South of the line of 30° N. lat., the mountains of Kurdistan terminate abruptly towards the table-land of Iran, and the country which lies between them and the desert, a space of more than 100 miles, consists of long and wide valleys running west and east and terminating in the desert. Little water is found in them, except after the melting of the snow, and only a small part of them is cultivated, though the soil seems rather fertile. North of Isphahan, as far as 36° N. lat., the Kurdistan mountains do not terminate abruptly, but between them and the plain there is a mountainous district, containing wide, fertile, and well watered valleys. East of this district extends a plain, about 40 or 50 miles wide, traversed by deep rivers and large lakes, and terminating on the border of the desert. It contains a few cultivated tracts. The central portion of Irak Ajemi which lies north of 35° N. lat. belongs to the table-land of Azerbaijan: its surface stretches out in a plain consisting of gradual ascents and descents, and furnished with the streams which descend from the highlands nearly the whole of this province is destitute of trees, it has excellent pastureage and many well cultivated tracts. The surface is considerably higher than the plain farther east, and therefore the climate is not so hot in summer. The range of the Elburz mountains, with its well watered and fertile valleys, and its high summits, is included in Irak Ajemi, as well as the hilly country which skirts its southern base, and which is generally well cultivated, being irrigated by the rivers that descend from the southern declivity of the Elburz mountains.

That part of the desert which is included in Irak Ajemi contains an oasis of considerable extent, in which the town of Yezid is situated. The oasis has a sandy soil, and is nearly enclosed by mountains. But the abundance of rainfall, which it produces much silk and fruit: the wheat that is raised is only sufficient for forty days' consumption, and large quantities of grain are imported from Isphahan. On the north, east, and south, the Great Desert spreads out to a great extent; but on the west, a series of mountainous districts, the town of Yezid with the more fertile districts east of Isphahan. The town of Yezid is very large, containing about 8000 houses and 36,000 inhabitants, among which 3000 or 4000 families are of the tribe of Guebres, or Arabians, and the rest the Persians. These mountains likewise constitute a great part of the population of the villages of the oasis. Yezid is remarkable as a commercial and manufacturing town. Its commercial importance arises from the caravan routes, which here cross another. Two of these routes come from Herat and Mushed: two
from the west, from Ispahan and Shiraz; and one from the north, from Kerman. Thus this town is the entrepôt of the commerce between India, Turkestan, and the western countries of Asia. Its silk manufactures are more extensive than those of other towns, and a great variety of silk stuffs are manufactured. Though a considerable quantity of cotton is grown in the town, still it is imported from the Ghilan. Cotton is also manufactured to some extent, as well as carpets and felts; and much sugar-candy is made and exported. The summers are very hot, but the winters are cold. A good deal of snow falls, but it does not lie long on the ground.

Ispahan, or, more correctly, Isfahan, is still perhaps the most populous town in Persia, though much less so than it was in the time of Chardin, when it was the residence of Shah Abbas the Great, and was the scene of a population of between 600,000 and 1,000,000 inhabitants. At present the population is said to amount to between 100,000 and 200,000. It stands on the banks of the river Zerzourud, which during the heats of summer has little water, but in the spring months is equal to the Seine at Paris in winter. The mud walls are 24 miles in circumference. The streets are crooked, narrow and dirty, and unpaved, like those of most Persian towns. Isfahan contains a great number of magnificent palaces, large private buildings, and spacious courts, and handsome houses, but most of which are now in a state of decay. On the southern side three nobly-constructed bridges cross the river; and near them, within the town, is a number of shaly avenues of trees, which render that part of the city a resort equalled only to that of the tomb of Shah Abbas the Great. This extensive building is vaulted above to exclude the heat, but it admits air and light: it is now nearly abandoned. In a still worse condition is the Maidan Shah, or Great Square, which is 700 yards long and 200 wide, and enclosed by a wall, in which are gates of massive iron. The Mohammedan bazaars have been abandoned, and the city is a heap of ruins.

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The ruins consist of heaps of earth and rubbish, strewn with broken bricks and crockery. On these ruins is built the village of Shahoul Asfah, which contains about 500 mud huts. About 70 miles to the east of Tehran, on the road to the Gulf of Abbas, is the fortress of Abyad, which is a strong place, well defended, and contains about 5000 inhabitants. It is a strong place, well defended, and contains about 5000 inhabitants. It is a strong place, well defended, and contains about 5000 inhabitants.

10. Ghilan comprehends the western portion of the low country of Persia, which extends from the Caspian Sea to the desert of the Great Salt Sea. It is the lowest part of the plain, and more subject to inundations and continual rains than Mazanderan, which lies farther east. During the greater part of the year it is a great swamp, covered partly with forest-trees and part with plantations of mulberry-trees. In the desert of the Caspian Sea, no villages in this country, the peasants residing either in single dwellings or in small communities seldom exceed eight houses. In some places there are bazaars, which, as well as the small clusters of villages, are situated in the midst of the forests or plantations of mulberry-trees. Resht, the capital of Ghilan, one of the most commercial places in Persia, is situated in the midst of a forest at some distance west of the mouth of the Sefid-rud. The population is variously stated between 50,000 and 80,000. The houses are of a superior construction, and the streets generally well paved. Its commercial connections extend to Mushad and Herat, Tehran and Isfahan, and also to Beshik and Astrakan. There are several extensive manufactories of silk and cotton in the town. The commerce is carried on by means of the port of Eliniloe, which is about 15 miles from Resht, and separated from it by a lagoon. The lagoon is from 30 to 40 miles long, from 13 to 15 miles wide, and from 3 to 10 deep; but, shallow near the land. It is separated from the Caspian Sea by a narrow sandy tract, which has a cut near the middle that serves as the entrance to the harbour of Eliniloe. It is about has a mile long, about 500 yards wide, and 8 feet deep; but the tide is high, and the winds are, on the average, about 4 feet of water; and, as the wind is about 70 to 80 tons burden, can enter the harbour of Eliniloe. This harbour lies on the west of the entrance, and is safe, being protected on the north by the narrow strip of land from the branch of the Caspian Sea, and on the south by an island. The town of Eliniloe is a collection of
miserable huts, built on the south side of the narrow strip of land opposite the harbour. The population amounts to 3,500. The goods to be shipped in this harbour are conveyed from Ruft and on horses to Pueri bazaar, which lies on the banks of a small river, one of the feeders of the lagoon, and at that place they are embarked for Ensillo in boats. Lajinjan is a neat well-built town, on an island formed by the bifurcation of the river Beldi. It has a considerable amount of the goods which are brought into the market of the town. The population, according to Fraser, amounts to 15,000, but Montreuil reduces it to 7,000. The most northern portion of Ghilan is called Talah; the mountains which divide it from the table-land of Azerbaijan are in possession of a tribe of Bardi, who, with the aid of their warlike dispositions, the Lezgis of Mount Caucasus, and are only nominally subject to the king of Persia.

11. Mazanderan comprehends the largest and widest portion of the low plain along the shore of the Caspian Sea. Though the country along the sea is very low and marshy, it rises somewhat at a short distance from the shore, owing to which circumstance the inundations produced by the heavy rains are less extensive and of much shorter duration, especially as the rains themselves are less frequent and less heavy, than in Ghilan. The climate is accordingly more healthy, and several plants are extensively raised which do not succeed in Ghilan, especially the sugar-cane and cotton; but it does not produce so much silk as that province. It is by far the richer, more populous, and more productive part of the province, and separates the district between Balfrush and Amol with Bengal. The most western town in Mazanderan is Amol, mainly built on the western banks of a small river, the Herhaz, in a very productive district, and the town is surrounded and closed by orchards and groves. It contains from 35,000 to 40,000 inhabitants, and has some commerce in silk, the greatest quantity of silk collected in Mazanderan being grown in its neighbourhood. The river is navigable, at least during the greater part of the summer, as far as the town for boats; the month does not form a harbour, but only some shallow lagoons. [AMOL.] Further east is Balfrush, the most populous and commercial town in Persia, with 36,000 houses, according to Fraser. [BAFRESH.] It stands on a very extensive plain, which is in reality a vast solid marsh, inhabited only by short grasses, and the chief water being a chief-iron importing marsh, which is used as lamp-oil all over Persia: also cloth, paper, hardware, gunpowder, leather, and iron; it gives in return the produce of the country, especially silk and sugar, with smaller quantities of rice, cotton, and timber; and also some articles obtained from the other provinces of Persia and from India. The river Bawul, on which it is built, is navigable for boats from the town to the mouth, where it forms a harbour for small vessels. The town is situated on the banks of a river, called Musheh-i-Sir, is very thriving: it also contains the shrine of a saint. The river near its mouth is 60 yards wide, and from 12 to 15 feet deep, but a bar at the mouth prevents vessels from entering it. Russian vessels which visit the Bawul, therefore, generally return by a route to the north, the roadstead, the larger vessels at a distance of about one mile and a half, and the smaller of about a quarter of a mile. Saree is considered the capital of the province, being a very ancient town and the seat of the governor. The walls, which are of mud, with square brick towers, are about two miles in circuit. The streets are unpaved, and often impassable in bad weather. The town contains a population of 30,000 or 40,000, and has some commerce with Astrakhan by means of a road extending from the Cabul river to Tagh-Terek, on the Caspian, and runs east of the town. At Farahabad some Russians have established a very extensive fishery, as great numbers of sturgeon enter the river: they send caviar and isinglass to Astrakhan. At this place are the ruins of a large square palace built by Shah Abbas the Great.

A great artificial road called keybân was constructed by Shah Abbas the Great, through the provinces of Ghilan and Mazanderan. It begins at Kakeер, the western extremity of the mentioned place. It is called Ghilan, and has Mazanderan, and Astrabad in their length, and ascends the declivity of the table-land of Iran by the pass which leads to Bostan in Khorasan, whence it is carried within a short distance of Mushed. In most parts it is still used, though partially by some places by torrents and inundations. It appears to have been 15 or 16 feet wide, and to have been constructed by filling a deep trench with gravel and stones, over which a regular causeway was very firmly built.

12. Astrabad comprehends the eastern portion of the low plain extending along the banks of the Caspian Sea, and the hilly country contiguous to it on the south. It is considered to extend to the banks of the river Attreok, but the country between that river and the Gourgan river, though of great fertility, is uncultivated and uninhabited, on account of the predatory incursions of the Turkomans, who wander about in the desert north of the river Attreok. In certain parts, however, the Turkomans are numerous on both sides of the two rivers. The portion of the plain included in this province is in general higher above the level of the Caspian Sea than Mazanderan and Ghilan, and much less populated. The fruit-trees succeed better, but the quantity of silk which is consequently not great. The climate, that of Mazanderan, is unhealthy, though less so than that of Ghilan. For a description of its capital Astrabad see Astrabad. The commerce is not important. Every year one or two caravans, consisting of from 80 to 100 camels, go to Khiva and Urgendh, but they are exposed to the attacks of the Turkomans, whose country they must traverse.

Manufactures.—The manufactures of Persia are numerous and of various kinds. All the towns, which once possessed a great population, and have not entirely fallen into decay, have preserved some branch of their numerous manufactures. But they have been much reduced, owing to the constant internal wars which laid waste the country for more than a century, and greatly diminished the population. Persian manufactures have a reputation for the power of producing and the means of purchasers. In the manufacture of some articles the Persians are still distinguished, as in several kinds of silk stuffs, especially those of the Persian silk-like, and the Persian velvets, para, and velour; in cottons, velvet, and metallic goods; in embroidery, damask, and velvets, and also in the manufacture of embroidery, and in machinery, and in the manufacture of embroidery, and in machinery, and in the manufacture of the articles of the times which are not manufactured in the West, and are in demand, for example, in the manufacture of the various kinds of silk, and in the manufac-

Commerce.—The internal commerce of Persia is very considerable. The different regions which compose this extensive empire in different natural productions, and the transport alone of commodities gives occupation to a great number of merchants and other people. To this must be added the produce of the manufactures, and the numerous articles which are brought into the Persian Empire from the neighbouring countries, especially from India, and are distributed all over the country. This commerce is entirely carried on by caravans. Though this mode of transporting merchandise is much more expensive than that in our countries, it can have no comparison with the former, so much owing to the want of roads, in which however the country is almost entirely deficient, as the impossibility of making them safe against robbers, and more particularly the predatory attacks of the wandering tribes. As the great thoroughfare of the country is the road between 20 and 25 miles in width, the trade is consequently carried on, on the very border of the deserts, which are haunted by tribes, and single travellers would be subject to continual attacks from them, and thus all are obliged to unite in a caravan to secure their safety.

The most frequently caravans route runs on the northern
side of the desert. By this road a great quantity of goods is brought from India and distributed over the northern parts of the country. It begins on the Indus at Attuck, and runs through Cabul, which serves as a centre of the trade of the caravans. Hence they pass to Cabul, and from Cabul in a south-western direction to Candahar, which direction they take to avoid the mountain region on the north, which is inhabited by the tribes of the Timurids and the Persians. From Candahar they proceed chiefly along the base of the mountain region to Herat. At Herat the road divides. One branch runs west-south-west through several oases of the desert to Tubbus, and thence to Yezdi. From the last-named place another branch runs north-west to Mushed, and thence through Nishapoor to Shahrood and Tehran. Conolly gives us an idea of the extent of trade carried on by this road when he says, that the duties levied on the merchandise sold at Mushed amount to 15,000 tomans, or about £10,000 a year. According to this estimate, the whole amount of their trade can hardly be less than half a million of English money. He enumerates also the articles, and indicates the countries from which they are brought, as from Japahan and Yezdi
fine velvet, silks, cotton-stuffs, felt, shoes, sugar, and candy-sugar; from Cashan, gold and silver, kimcoy, cotton-socks, ink-stands, lamps of bronze, pots, and other utensils of copper; from Shiraz, dates, tobacco, lemons, laquered-ware, ornaments made of ivory, and mate; from Kerman, shawls, candy-sugar, opium, henna, and indigo; from Sind and Hind, sugar, candy-sugar, spices, musk, amber, corals, precious stones, leather, kimcoy, Indian and British muslins, and indigo; from Cashmire and Bokhara, shawls, saffron, paper money, and more of Russia by the way of Bokhara and lamb-skins (more than 120,000), stuffs made of camel-hair, tea, and Russian manufactures, as shagreen, broadcloth, satin, nankeen, china, glass, utensils of iron, copper, brass, cutlery, looking-glasses, needles, &c. Since the navigation on the Caspian Sea has increased, Russian goods are brought from Recht and Balfrush. From Herat are brought to Mushed, carpets, assafandin, lead, saffron, pistachio-nuts, mastix, manna, gummi, aspircu (a yellow dye), and caraway-seeds.

When the commerce of Gombrro was flourishing, a cara-
van-road led from that seaport to Kerman, and thence to
Shiras, Ispahan, and Cashan, but that road is at present
very rarely used. The great roads which lead over the
mountains are, one from Tabriz to Bagdad, and the other
south-westwards through Hamadan and Kermanshah to
Bagdad, or north-westward to Tabriz and thence to Erzerum
and Sivas, are much frequented. A well frequented road
leads also from Tabriz to Tiflis in Georgia.

The commerce of Persia is less important than the
internal trade. Fraser, who had many opportunities
of collecting information on that point, gives the following
table:

<table>
<thead>
<tr>
<th>Country</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>That from Balfush is estimated to amount to £43,000.</td>
<td>£43,000</td>
</tr>
<tr>
<td>Allow for exports from the smaller ports on the Caspian Sea. Including the silk of Ghalian and Mazanderan, let it be stated at £25,000.</td>
<td>£25,000</td>
</tr>
<tr>
<td>The commerce with Bagdad, which is considered, particularly in silk, of which 12,000 maunds shobee are sent thither, may be taken at £200,000.</td>
<td>£200,000</td>
</tr>
<tr>
<td>That with Tiflis and Georgia, including a similar quantity of silk.</td>
<td>£200,000</td>
</tr>
<tr>
<td>The exports to Bokhara and the states to the eastward.</td>
<td>£50,000</td>
</tr>
<tr>
<td>That with Arabia.</td>
<td>£16,000</td>
</tr>
</tbody>
</table>

£1,222,000

According to this statement, Fraser finds that the exports of Persia are under a million and a half sterlimg. Though we think that nearly all his statements may be considered as approximations to truth, we must observe that he has omitted the exports to India by the way of Herat, and that he has also greatly underrated the exports of the places on the Caspian Sea, when he makes the exports from these harbours, excluding Balfush, but including Recht, only amount to 34,000l. per annum. He himself states the export of silk from Ghalian to Astrakhan, in another of his numerous and instructive works on Persia, at 20,000 maunds a year. According to Recht, the statement, we must increase the second item of his list by at least 200,000. The exports of Recht, besides silk, are rice, gall-nuts brought from Kurdistan, otter skins, and cotton-clth. The imports consist of iron, copper hardware, looking-glasses, glass bottles, and various articles of silver and gold wares from Moscow, and utensils of wood.

Government.—Persia is an absolute monarchy, in which the will of the sovereign is not, as in almost all the mo-
narchies, a law to the people, but controlled and limited by institutions which have existed for a long time, and which cannot be infringed without exciting universal discontent. Institutions and a political order of this kind formerly existed, but they have been annulled in the continual intestine wars which have desolated Persia during the last century. In Persia the word of the king is law, and the life and property of the subject are in his hands. He delegates his power to the governers of provinces, reserving to himself the power of life and death, with which he entrusts only the governors of the royal blood, and such persons as are sent to govern distant provinces or such as are in a state of rebellion. Kurdistan is peculiar but a called Il-
dara, and those of smaller districts kolumbogs. The tribes of the Illyats however are not subject to these governors, but are under their own hereditary chiefs, who often pay very little respect to the orders of the king, whenever they think that the object of the king's order is not consistent with the law, which is not exercised by the governors, but by courts. There are two different kinds of courts in Persia, the sherhá courts and the urf courts. The former decide matters according to the Koran and the traditional commenta-
ta on this holy book; the other courts are more arbitrary. The limits between these two different kinds of law-courts are not fixed, but vary with the character and disposition of the sovereign. A sovereign of a strongly religious buss inclined to refer all cases to the sherhá, while other sove-
rigns have tried to invest the urf courts with the chief authority. The supreme judge in the sherhá courts is the Shiek-al-Islam, who decides matters in the last instance, aided by the advice of the muftis, or chief pontiffs. In the urf courts the judge in law, who is also a judge, is aided by a council of notables. The en-
feoffment is administered by the king himself, and his governors and delegates. The courts are held in public, and the monarch sits for a certain time each day in his hall of audience, to hear appeals against the judgments of the local courts, and to decide such cases as come before him.

The army of Persia consists of about 40,000 men regularly
disciplined, of which only about 200 are organised on Eu-
ropean principles. But the king can in a few weeks roll as
collect a body of 100,000 men, the greatest part of which number is supplied by the tribes of the Illyats, and consists of irregular cavalry.

(Kinneir's Geographical Memoir of the Persian Empire.)

Ouseley's Travels in various Countries in the East, were particularly interesting to the author of Moore's Travels, living through the island of Crete, and thence to Bagdad, by the Western Route. His Second Journey through Persia, Armenia, &c., Fraser's Narrative of a Journey into Khorasan, his Travels and Ad-
ventures in the Persian Provinces on the Southern Eastem of the Caspian Sea, and his Historical and Descrip-

Language.—The history of the language of Persia, the
time of the empire, may be divided into various periods
since, under each of the dynasties of which we have any
remaining monuments, there was apparently a change in
the dialect of the kingdom. That this was the infancy of the Persians, in which there is a great deal which has
been discussed, is far from being satisfactorily ascertained.
Some say that the Zend and the Pehlvi were the two pre-
vailing languages; the former being spoken in the north,
the latter in the south. Others assert, not without founda-
tion, that the Zend was not a general language, and that Zerathuist, or Zoroaster, having composed this
language his book on religious and moral duties, emi-
ted "Zend Avesta," two Pehlvi words which signify "living
soul," the dialect in which that work was composed was ev-
"the language of the Zend," while, if we are to believe Sir
William Jones (Works, vol. iii., p. 113), who said it from a
disciple of Zoroaster, Zend was the name of the character, in which the books are written, and Avesta that of the language. [Zend.] Be this as it may, the Zend must have fallen into disuse at a very early period, being intelligible only to a few; since, in order to propagate the religious tenets of the Zend Avesta, the priests deemed it necessary to have the work translated into Pehlevi. It was undoubtedly extinct before the commencement of the vulgar era, and we are told that among the Gobars or Guereus, who still adhere to the doctrines of Zoroaster, the Zend Avesta is preserved. In Persia, it is called either from the heroes or warriors who spake it in former times, or from Pahlav, the name for Media or Parthia among the natives. It was first spoken nearly at the same time with the Zend, and attained to a high degree of perfection under the Sassanian kings. It is the same language as the modern language of the nobility and the court, until, by the removal of the seat of the empire to the southern provinces, and the edict issued by Balkarn Guîr (A.D. 351), prohibiting the use of the Pehlevi in his dominions, that language gradually fell into disuse, and made way for the Pahlavi, or the idiom of Parsi, the Persian proper. This language, being more expressive and rich than the former, and being countenanced by the sovereignty, and spoken by the court, the nobility, and the learned, became the language (Pharsavi, the court), to distinguish it from that of the country where the Pehlevi and other rude dialects still prevailed under the generic denomination of Zobân Parsi. It has been lately asserted by a eminent philologist, Frank, that the Pahlavi is a mixture of the Zend, the Persian, and the Arabic; but this opinion is not generally entertain that the contrary is the case; but if we consider the greater simplicity of the Pahlavi, the former opinion seems the most probable. There can however be no doubt that the Pahlavi, has a character of its own, and is a kind of a Persian language of the Brahmanese, while the Pehlevi is closely related to the Chaldœan. Lepinits has not hesitated to assert that the resemblance between the Tohtonic languages and the Pahlavi was so great as to allow any German of the vocabulary of the Pahlavi. Persian proper is the purest form of the language. After the conquest of Persia by the Arabs, Mohammedians became the prevailing religion, and Arabic by degrees the language of the learned. At first it was cultivated for the purpose of reading the Koran. The addition not only of words and phrases, but the language itself, was partly because words were wanting in Pahlavi to express many new ideas, and partly from an affection of elegance, the Persian poets and rhetoricians striving to imitate the Arabian writers, whom they considered as their masters. The modern provinces of Persia, as well as the principal cities of the interior, and the courts of the most illustrious families of the modern Persian nobility, use a language of their own in all the provinces of Persia, but was also introduced into India by a descendant of Timur, who founded the Mogul empire. But the old dialects of Persia were not entirely extinct. According to the reports of travellers, the Pahlavi is still in use by the Persian Gobars, and by a few among the Guereus, or fire-worshippers; and some of the rude Kurdish dialects are considered to be pure Pahlavi. The modern Persian, though neither so rich nor so expressive as the Arabic, is more harmonious and better suited to the poetry of the country. The prophet Mohammed was once heard to say that 'the language of Persia would be spoken in Paradise, owing to its extreme softness.' In the simplicity of its grammar it has been compared with the English; in its power of compounding words, with the poetry of the Chinese. The Pahlavi seems to have been written with the addition of four letters with three points. The Persian books are generally written in the form of hand called taqâš: although it is not uncommon to meet with works written in this manner, it is not used by the Arabs in common life. Other systems or schools of writing seem to have been in use at various periods, such as the Tàhâth, the Yâkštîr, and the Tawura, all of which however were founded upon the Arabic alphabet, and differed only in the order of the letters. To European students who wish to acquire a knowledge of the Persian language, the following elementary works may be recommended:—Sir William Jones, Persian Grammar, in the fifth volume of his Works; Gladwin's Perzisches Grammatik, 2d ed., by Duncan Forbes and Sandford Arnot, Lond., 1816.

Those of Lumden and Richardson are also valuable works. In Germany, those of Donbaj, Viennâ, 1804, and Wilken, Lips., 1804-5, are most in use. Of Dictionaries we have, besides those of Meninski and Baretto, that of Richardson, reprinted by Wilken, Lond., 1806, and the abridgment made by Hopkiss, Lond., 1824.

Literature.—The literature of which the Magi were in possession, until the introduction of Islam, has scarcely anything to show in its old dialects, the Zend and the Pehlevi, but such parts of the books of Zoroaster as have been preserved, and those preserved in the same, and the Persepolitan inscriptions, which are for the most part unintelligible. It is true, that during the reign of Nushirwan, surnamed 'the Just,' who lived at the close of the sixth century of the Christian era, and was a liberal patron of literature, some of the Zend works were translated into the Pehlevi dialect, which were extant even after the time of Mohamed; but they have since perished. Of this number is a Pehlevi translation of a collection of moral fables, entitled the 'Fables of Bulpai,' which Barzayeh, chief physician of Nushirwan, made from the Sanscrit by the orders of that monarch. [BIDPAI.]

Sand, one of Omar's generals, is likewise reported to have found in the tent of a Persian general, after the battle of Khadiyash, a history of Persia in the Pehlevi language, and to have preserved it in an Arabic translation, and composed, it is believed, by the command of Nushirwan. As to the Dari or Pahlavi, after it became the language of the court, it was very much cultivated by the Sassanian kings and their vizirs, many of whom published works in it. The first Persian poem of which we have the text is the 'Kar-nâmeh,' or a journal of his achievements, as well as a work on morality, which was improved upon three centuries afterwards by Nushirwan. A vizir of this latter monarch, named Bastiz, wrote the 'Zefar Nâmeh,' a work which is only preserved in part, written in the same style; and the same phrase made by the celebrated physician Avicenna (Ibn Sennâh), about the beginning of the eleventh century. During the first two centuries after the Mohammedan conquest, Persian became the national literary language, and was cultivated under the khalif, who gave the preference to it over Arabic. When the power of the Abbasides began to decline, a number of independent princes arose in the different provinces of their empire, who vied with one another in promoting the cultivation of letters. The accession of the Boughay fame to the throne of Persia, in the tenth century, marked the great epoch of the revival of Persian learning. A sort of rivalry was then called forth by the fact of three contemporary princes, all lovers of letters, reigning at once in the three principal capitals of Persia, then the seat of the upper, middle, and lower order of the court, of the nobility of the Seljûkides; Khedër Ibn Ibrahim, sultan of the Ghaznavides; and Khedër Khan, king of Turkistan beyond the Gihon. To the united efforts of these three monarchs, and to their liberal encouragement of letters, the Persian literature of the period is said to have reached its highest point, and all its lustre. This flourishing state continued until the beginning of the thirteenth century, when the invasion of Gengis-Khan gave a violent shock to all the arts of peace. At the same time that of one of his vizirs, in celebrated epic century; but that conqueror, far from discouraging polite literature, adopted the religion and the language of the country, and promoted the fine arts by his boundless munificence. The Turks themselves, who ravaged Persia during the ensuing centuries, greatly improved their harsh dialect, by mixing it with the language of that country, and one of their sultans, Mohammed II., who took Constantinople, is enumerated among the best lyric poets of Persia. In the sixteenth and seventeenth centuries, under the rapid decay of the Seljûkides, the Persian literature sank to the lowest state; even the language was corrupted, and borrowed some of its terms from the Turkish, which was commonly spoken at court. Literature however continued to receive some encouragement, and the workers of more modern times. We shall here give, from Sir William Jones, Von Hammer, and other authorities, a rapid sketch of the history of Persian literature, and an account of numerous works on all subjects which fill the shelves of the public libraries in Europe, we shall confine our attention to a notice of those which are already known to Europeans either by extracts or translations. After Pirzâzé, who wrote the beginning works, were written in the Pehlevi dialect, from which we are to judge from the works of Sheikh Mohammad Ali Harân, which Belfour translated (Lond., 1839, 8vo.), and other writers of more modern times. 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In the year ending May 31, 1851, the whole amount of exports from Persia to India at the port of Bushire, according to official reports, was stated at about £305,000. This estimate is obtained by the merchants there to be about annually £215,000, but in order to include the whole remaining exports from Gilan and Mazanderan, which are stated at £250,000, and to allow for exports from the smaller ports on the Persian Gulf, including the islands, 10,000, the amount is raised to £325,000.

The commerce with Bagdad, which is considerable, particularly in silk, of which 12,000 mounds of shooheh are sent thither, may be taken at 200,000, that with the rest of Turkey, including a similar quantity of silk, 200,000, that with Teffis and Georgia, 200,000, that with Bokhara and the states to the eastward, 50,000, and that with Arabia, 10,000, making a total of £1,225,000.

According to this statement, Fraser finds that the exports of Persia are under a million and a half sterling. Though we think that nearly all his statements may be considered as approximations to truth, we must observe that he has omitted the exports to India by the way of Herat, and that he has also greatly underestimated the exports of the places on the Caspian Sea, when he makes the exports from these harbours, excluding Baku-flush, but including Resht, only amount to 33,000 per annum. He himself states the export of silk from Gilan as amounting to several hundred thousand shoohehs, and his narrative review of Persia, at 20,000 mounds shoohehs, and, according to his own statement, we must increase the second item of his list by at least 200,000. The exports of Resht, besides silk, are rare, gill-nuts brought from Kurlow, attache skins, and cotton-cluth. The import consists of iron, copper, hardwood, looking glasses, glass, cutlery, paper, tea, silver and gold wares from Moscow, and utensils of wood.

Government.—Persia is an absolute monarchy, in which the will of the sovereign is all, and in almost all the monarchal states of Europe, controlled and limited by institutions which have existed for a long time, and which cannot be infringed without exciting universal discontent. Institutions and a political order of this kind formerly existed, but they have been annihilated in the fiendish interregno wars which have desolated Persia during the last century. In Persia the word of the king is law, and the life and property of the subject are in his hands. He delegates his power to the governors of provinces, to the power of life and death, with which the governors of the royal blood, and are dedicated to govern distant provinces or rebel provinces. The governors of the provinces, and those of the smaller districts of the ill-hated are not subject; but are under their own hereditary pretension to the orders of the king. The governors are inclined to refer all cases to the king's reigns have tried to invest their authority. The supreme judge is the emperor. Sheikh-ul-Islam, who decides by the advice of the judges of every town there is such a judge, who is said to be from the king and is administered by the king himself. The sovereign is entitled to sit for a certain time each year, and to receive presents, as well as to appear before him. The army of Persia consists of 100,000 men, and is supplied by the tribes of Persia, which is, as well as cavalry, and is the most excellent. The emperor's Geographical Travels in the particular Persia: Second Journey from the Persian Gulf to the Caspian Sea, 1850. A translation of the Persian by Mohammd. Nasir, the fourth of the four, and which has been translated into English, the London Oriental Travels (the morrow of history) by a Mr. A. A. M. Said. The history, entitled Ouseley's Travels in the Persian Gulf, 1851. Some Account of Persia, and the Traveller Teixeira (Relaciones), vol. viii.; D'Aubusson (the rising of the French, the last). Review of Persia, and the brothers, and the history of the Map of Persia, by Muller, 1877. The Travels of A. A. M. Said, in 1851-52, were published in London, 1854. The Map of Persia, by Muller, 1877. The Travels of A. A. M. Said, in 1851-52, were published in London, 1854. The Map of Persia, by Muller, 1877. The Travels of A. A. M. Said, in 1851-52, were published in London, 1854.
short periods of time, or the history of single dynasties and single reigns. The 'Tarikh Al-Mosâfer' contains a history of seven princes of the family of Mosâfer. Shah Babur, or Baber (Bâber), the great grandson of Timur, left in the Mogul language some valuable contributions respecting Hinduists, which were translated into Persian by Abd-er rahim, and thence into English by Dr. Loyden and Erskine. Abd-er-râzâk wrote a history of Shah Rokh (Timur's son) and his successors, as well as an account of his own embassy to China and Bokhara. Abd-er-râzâk, in his 'Histoire de la Légende in the Collection portative des Voyages' (Paris, 1797-1835, 8vo.). Mohâlib Shereef ed-din Ali Jedîl, who died in 1466, wrote a biography of Timur full of facts, which was translated into French (Paris, 1805). Sir William Ouseley, an Anglo-Indian, was the first to translate it. (Sir William Jones, Works, Lond., 1807; Sir William Ouseley's Persian Miscellanea, Lond., 1795; Oriental Collections, by the same, Lond., 1797; Punckirgubn des Orient; Notices et Extraits des Miss., &c.)

Religion.—One theory says that the religion of the antient Persians is principally derived from the Zendavosta, or sacred books of the Persians, which were first made known to Europeans by Anquetil du Perron (Anquetilli), and have ever been more fully explained and elucidated by Kleuker, Eugene Burnouf, and lately by Sir William Ouseley. The Zendavosta is the Zendavosta of the Zendavosta, a book perhaps contemporary with Zoroaster, and is supposed to be a translation of the Arabic one, by Jeddâl, which was published at Constantinople, in 1742; that of Seid Ahmed, printed at the same place, 1804; and the Persian dictionary, by the king of Oude, called 'The Seven Volumes,' which was published at Lucknow, in 1809. (Sir William Jones, Works, Lond., 1807; Sir William Ouseley's Persian Miscellanea, Lond., 1795; Oriental Collections, by the same, Lond., 1797; Punckirgubn des Orient; Notices et Extraits des Miss., &c.)

In geography the Persians may be said to have derived most of their knowledge from the Arabs. They have a tradition of this from an Arab; but on the map we have the grapher of the ninth century [Haukal], as well as of the large work of the celebrated Kazwin, entitled 'Ajambyul-makhkullikht' (the wonders of creation). They possess also a work entitled 'Heti Jikand' (seven climates), by Ar-râzâl, which contains some of the phenomena of nature. Sir William Ouseley (Lond., 1800. 4to). The same may be said of medicine. Geometry and astronomy seem however to have been cultivated by them with greater ardour. Naşir ed-din of Tabriz, the superintendant of the observatory and astrologer at Tabriz, was a Maragha, a transit of which is recorded by Sir William Ouseley. The works of Euclid, which were afterwards commented upon by Maymund Rashid. (Naşir ed-din.) The latter author composed, at the command of Hulakî I. Ishân, the astronomical tables known by his name, but which were not compiled. Other tables were drawn up in the first half of the fifteenth century, by order of Ulugh Begh, which were afterwards published in Persian and Latin by Greaves and Hyde, under the title of 'Nizam-ul-Makkûl.' A translation of it by Sir William Ouseley was published in Persian calendar, under the title of 'Nizam-ul-makkûl'; was also printed in the collection entitled 'Vlug Beigi Epico-celebros,' Pers. et Lat., by Greaves (Lond., 1650). To the same class belong Bek's 'Ephemerides Persarum per totum Annurn' (Vindobona, 1695, folio), and Welsh's 'Tabulim Equinociales,' Augsburg, 1676, 4to.

The works on ethics are very numerous. We shall only mention the 'Akil-e-nâserî, so called from its author name ed-nâserî, a translation of which was lately pronounced by the Rev. G. Keene; and the 'Akil-e-jelîl, published by the Oriental Translation Fund. The works on theology and jurisprudence are not less numerous. There is a Persian translation or abridgment of the Vedas, entitled 'Kohus,' a translation of which was published by Anquetil du Perron (Paris, 1804, 2 vols. 4to.). The 'Dastân' was published at Calcutta, in 1811. The commentaries upon the Koran are chiefly in Arabic.

The Persians have paid great attention to their language, as is seen in the 'Kooholot,' i. 131, 132, published in 1822, in which they adopt the curious and odd symbolisms of Nain-kul, or God (Grace of God), used by Castells in the composition of the Persian part of his Lexicon Hebrew; Ipton, Lond., 1659. But the most celebrated are the 'Ferhang Jâhân-gil,' by Jammî ed-din Huseyn ibn Faqir ed-din, who dedicates it to his father, Annâ Jâghân-gil; the 'Ferhang Jâghân-gil, supposed to be a translation of the Arabic one, by Juchâl, which was published at Constantinople, in 1742; that of Seid Ahmed, printed at the same place, 1804; and the Persian dictionary, by the king of Oude, called 'The Seven Volumes,' which was published at Lucknow, in 1809. (Sir William Jones, Works, Lond., 1807; Sir William Ouseley's Persian Miscellanea, Lond., 1795; Oriental Collections, by the same, Lond., 1797; Punckirgubn des Orient; Notices et Extraits des Miss., &c.)
There are a few followers of the ancient religion existing in the present day in Persia, but they are in a degraded and oppressed condition. Sir R. K. Porter remarks (Travels, vol. ii. p. 461), that 'from these vestiges and four and twenty, they have been held for so many generations, both the doctrines of their faith and the most solemn rites of their worship have sunk into nothing more than a few hasty prayers muttered to the sun as supreme God; and what their ancient ceremonies confused shadows of their former religious festivals.' At Bombay however the Parsees are a very active and rich class. They are in fact the proprietors of the greater part of the island. They are described by Lord Valentia (Travels, vol. ii. p. 318) as numerous and prosperous, in the native orders, and in the lower, active and intelligent, far surpassing as servants either Mussulmauns or Hindoos. They mostly speak English with propriety. In their persons they are a handsome race, fairer than the natives, though not possessing the clear skin of the corresponding ex-persians they are uniformly conciliatory and mild. They have numerous temples to fire, but their priests have no authority in temporal concerns, nor much spiritual control.'

(lyd., Velorum Persarum et Magnorum Religionum Historiarum Libri i.-vii. 1.461. 4.60. Brihl, Biographie, Meder, and Perser, or des Zendolcos, 1829; Gibbon's Decline and Fall, c. 8: Herzen's Researches, &c., 'Asiatic Nations,' v. i., 366-382; Engl. trans. ; Herbert's Travels ; Niebuhr's Nachrichten, &c., &c. vol. ii.; d'Aubert du Pont's, Kleuker's, Olshausen's, and Eugene Burnouf's editions of theZendevata.)

History. — The only credible and consistent account which we possess relative to the early annals of Persia is that derived from the triumvirate of the corresponding sources; these can occasionally be traced between these statements and the traditions of the Phishadian and Kaianian dynasties preserved by Mirkhond and Firdusi, the incidents of the latter, and the marvellous exploits and length of reign (summarised into three or four centuries) attributed to several of the monarchs, class them rather with mythological tales or romances of chivalry, than with the sober records of history. At the earliest period of which any trace is preserved, Persia appears to have formed a province of the Medes, and the empire, on the dismemberment of which fell under the power of the Medes. Dejoire, the founder of the Median monarchy (about 709 B.C.), has been considered by some writers to be the Kai-Kaus of Oriental story: though others have held this name to be synonymous with Kasshu, the founder of the dynasty of the Medes, or (or Trans-Oxian Turks) from Southern Asia. Asyges (Kai-Kobad?), the successor of Cyaxares, was dethroned (560) by Cyrus (Kai Khosru?), who, according to Herodotus, who was his brother and a rival for the throne of the Medes, but by his victory over Ciusus, king of Lydia, which terminated (546) the dynasty of the Mermahiss in Asia Minor, and by his conquest in 538 of Babylon and its dependencies, was the conqueror of the Medes and Persians over the Persians, who formed the Medes, but by his victory over Ciusus, king of Lydia, which terminated (546) the dynasty of the Medes in Asia Minor, and by his conquest in 538 of Babylon and its dependencies, and the Persian empress, the heir of the Median throne, and the Persian empire under the Medes and Persians. A great princess (529) commenced the revolution against the Scythians, probably beyond the Oxus; and was succeeded by his son Cambyses (529-21), who subdued Egypt. On his death the kingdom was usurped by a Mazicn, who possessed Semiramis, the brother of the deceased monarch: but this impostor was destroyed by the nobles, who raised to the throne one of their own body, Darius Hystaspes (Gushaspes?). In his reign (521-465) the empire was divided into satrapies, and regular taxes introduced. But the Persian empire was still weakened, and was destroyed, though a Persian expedition, under the command of Darius himself, against the Scyths was a failure, the acknowledge- ment by Macedonians and Thrace against Persian supremacy extended the empire into Europe. The revolt of the Asiatic islands further weakened the empire, and gave the origin of the long wars of Greece and Persia. The defeat at Marathon (490) of a Persian force sent against Athens, showed the determination and military skill of the Greeks to be formidable; and hence resulted the famous expedition which, in 485-64, conducted in person against Greece. Herodotus states it to have consisted of above five millions of men, including an army of 1,700,000 infantry and 80,000 cavalry, and 30,000 horse. But this stupendous host, though it ravaged Attica and burnt Athens, was sustained from defeat at Salamis: and the following year, after Xerxes had returned to Asia, the land and sea forces were disposed in the two battles, fought on the same day, of Plataea in Boeotia, and Mycale on the coast of Asia Minor. The Persians were now no longer》
his successor Artabanus II. both fell in battle against the Trans-oxians, or Turks; but these predatory hordes were repelled by Mithridates II., whose embassy to Syria (32) was the first intercourse between Parthia and Rome. The reign of Mnemonias (87-76), Simotaces (75-68), Phraates III. (68-60), and Mithridates III. (60-54), were occupied by continual civil wars: but the sway of Orodes I. (54-37), who had dethroned and put to death his brother Mithridates, was disturbed by the war of the two Orodes. However, with the death of Orodes I. and slaughter of Crassus with his legions on the plain of Carrhae (53). In invading Syria and Asia Minor however, the Parthians were repulsed by Ventidius (38); but this defeat was avenged by Phraates IV. (A.C. 37, to A.D. 4) on Mithridates II. in the parsley of his brother. The loss of the greater part of his army, some years later however Phraates opened diplomatic relations with Rome, and even sent his sons to be educated at the court of Augustus. The death of Phraates was followed by anarchy and dissension: Phraates, Orodes II., and Orodes I., occupied the throne for short periods; and under Artabanus III. (14-44) the monarchy began rapidly to decline; the Romans even occupied the country for a short time, and proclaimed Tiritids, one of the Arsacids, as king; but Artabanus recovered his kingdom, and the regency of the usurper. The reigns of Bardanes (Wardan?) (44-47), Gotareses (47-50), and Vonones II. (50-52), contain nothing worthy notice excepting an unsuccessful attempt of the emperor Claudius to nominate a prince named Meherdatis in their kingdom; in the persecution of the Christians by the emperor of Rome with Rome was occasioned by disputes relative to Armenia, which were settled (65) by Tiridates, brother of Vologeses, accepting the Armenian kingdom as a fief of the Romans, and resuming the constitution and monarchy, and the usurper. The reigns of Vologeses III. (121-149), and Vologeses IV. (149-191), and Vologeses IV. (191-209), were marked by almost continual wars with Rome. Ctesiphon, the capital of the Parthian empire, was razed to the ground by the army of Secundus Severus in 191; and in these contests, though they occasioned no loss of territory, greatly weakened the declining monarchy. Under Vologeses V. (209-16) civil wars were superadded to the attacks of the Romans; and his successor Artabanus IV. (196-166), after a reign of twenty years, defeated and killed, a.d. 226, in the last of three battles against Artaces or Arsaces, or Ardashir, surnamed Babgahan, or the son of Babek, a native of Pars, or Persia Proper, who overthrew the Parthian monarchy and constitution, and established, with the dynasty of the Sassanids, a new order of things in the East.

The erection of the Sassanid dynasty commences a new epoch in the history of Persia; which ancient appellation henceforward repels the Parthian, or Sassanid, to denote the native annals begin to supply comparatively authentic materials. The reign of Artaces or Arsaces, or Ardashir Babgahan, after he attained undivided power (226-42), was occupied, from 226, for a time the renown of the Persian new dominions, and re-establishing in all its antient splendour the Persian power, and the exclusion of all other religions; and his memory continued to be venerated as long as his descendants occupied the throne, both as the restorer of the Persian monarchy and religion, and as a legislator whose enactments and maxims of government were considered as the fundamental institutions of the country. His son Shahpoor, or Sapor I. (242-73), a fierce and warlike prince, who conquered Armenia, and by his victory, in 290, forced the Romans to submit, and reign over the army, and, died in captivity), taught the Romans to respect and fear the arms of Persia. Syria, Cilicia, and Cappadocia were left waste with ruthless severity; Antioch was taken and plundered, but the latter part of his reign was passed in ease for Palmyra, and Seleucia. His celebrated wife Zenobia, defied his arms, and Aurelian re-established the Roman frontier in the East.

The reigns of Hormuz or Hormidas I. (272-3), of Varames or Varanes I. (59-77), Bahram II. (277-94), Bahram III. (294), present no incident of importance except the unfortunate Roman war in the weak reign of the second Bahram, in which Persia was only saved from ruin by the sudden death of the emperor Carus. Narses, or Narses' (293-304), while the war was in progress, incurred the rage of the Parthians, and was put to death by them; the soldiers, with a signal victory (296) over Galerius; but in the next campaign the Parthian forces were surprised and de-

stroyed by the Romans, and, by the peace concluded in 297, Nares ceded Armenia and five provinces east of the Tigris. The reign of Hormidas II. (301-9) was peaceful, and the long and splendid reign of his august andunnounced son and successor Shapoor, or Sapor the Great (309-40), who was acknowledged as king even before his birth (Gibbon, ch. xvi.), revived the ancient glories of the monarchy. His long war with the Romans (327-63) was contested with the whole of the empire, and with various success; and the battle of Singera (249) Shapoor triumphed over the emperor Constantius; and the invasion of Persia by his successor Julian, which threatened the dismemberment of the kingdom, was frustrated by the death of that prince and the Roman general, who purchased the peace of Dura (363), which restored Armenia and all the cessions made by Nares, with the impregnable fortress of Nisibis. The wisdom of Shapoor in government was equal to his valour in war; and the kingdom continued in peace and prosperity through the reigns of the next three monarchs, Artaxerxes or Ardashir II. (380-85), Shapur II. (385-99), and Bahram or Varanes IV., surnamed Kamrashab (390-401), the founder of the city of that name. Yazdegerd I. (Iseligertis) engaged in no foreign wars, but his reign was marked by the destruction of the fire temple at Persepolis in 394. In the attempt to conquer the Magi murmured at the toleration and favour shewn by the king to the Christians, and his friendship for the Greek emperor Aecarius gave rise to the fable that the latter entrusted to him the guardianship of his son Theodosius; but he died in the course of his expedition against that prince. Shapur V., surnamed, from his love of the chase, Gour, or 'the Wild Asa,' commenced his reign, led to a short and indecisive war with the Romans. The subsequent course of this prince was regular and peaceful, and Persia wasted no more than she had done by the invasion of the Turks of Trans-oxiana. He extended his realm to the frontiers of India; and his extraordinary personal prowess has preserved his memory to the present day in Persia as a favourite hero of romances. He perished accidentally in the course of an expedition against the Franks, or Fris or Firis, who had laid waste to the land of Armenia by the Khan of the White Huns, or Turks of Trans-oxiana. Firouz however returned this service by attacking the dominions of his benefactor: in his first invasion he was defeated and taken prisoner, but released by the generosity of his conqueror. In the war between the Persians and the Turks of Trans-oxiana, he extended his realm to the frontiers of India; and his extraordinary personal prowess has preserved his memory to the present day in Persia as a favourite hero of romances. He perished accidentally in the course of an expedition against the Franks, or Fris or Firis, who had laid waste to the land of Armenia by the Khan of the White Huns, or Turks of Trans-oxiana.
his father only six months, and in four years of confusion and civil war the throne was filled by six kings and two queen-kings till the ascension of Yezelejerd Ili, in the same year (632) in which Persia was attacked by the Arabs, then commencing the career of Mohammedan conquest. The fate of the kingdom, weakened by internal dissensions, was decided by the battles of Cadesia (636) and of Nehavend (641). On the last of which, though the king survived in the condition of a fugitive ten years longer, subverted at once the Sassanian power and the independence of the country. For more than two centuries after the Mohammedan conquest, the national history of Persia presents an entire blank. The Persians imbibed the religion and literature of the Arabs, to whom they imparted in return their civilization and luxury; but the country was only a province in the empire of the caliphs, and followed implicitly the revolutions of the Omeyyades and Abbasides. [ARABIA: ABBASIDES, MABAS.] But with the decay and division of the power of the Commanders of the Faithful, the spirit of independence revived, and the re-establishment of the kingdom may be dated from the foundation of the Soffrian dynasty by Takub Ibn Lais, who about 868 threw off his allegiance to the caliph, and fixed at Shiras the capital of a dominion including nearly all Persia. But his brother and successor Amer was subdued, in 900, by the Tartar family of the Samanides, who ruled Khurassan and Trans-Oxiana till 999, while Western Persia, again acknowledged for a few years a precarious allegiance to the caliph, till the utter disruption of the Abbaside power threw it, about 936, into the hands of the three sons of Bouyah, Amad-ed-doulah, Rukn-ed-doulah, and Moazzem-ed-doulah, who shared the kingdom among them; while the last-named occupied Bagdad, and exercised, under the title of Emir-al-Omarrâ, absolute control over the Persian and remaining territory of the caliph. After the death of Bouyah, Amad-ed-doulah, nearly all the dominions of the Bouyahs (sometimes called Dzilmas) dynasty were reunited to his nephew or successor Adhad, or Azad-ed-doulah, the greatest and most virtuous of his successors, his reign of thirty-four years (949-82) is the most glorious of his family and of the prosperity of his successors again divided the kingdom, and was then in internal dissensions, during which the principalities rose to independence. One of the Bouyahs continued however to reign as Emir-al-Omarrâ, raising his title-caliphs at their pleasure; but Eastern Persia, was subdued, in 1016, thirty years earlier had founded Ghaznevides in Cabul and in the Sassanian power, and had once more, into the heart of the family, when the princes were of Central descent from Central Persia, assumed their independence and succeeded near Nishabur to which they placed the court of Malek, of Abras, and of Khurasan, Perso-Turk. Re-established, Saladin, feasted and taken, rule of his son extended. Tartary, while internal peace, administration of the famous reformation of the calendar, by the Seljouk era (March 13, 1675). shows science kept pace with that of conquest. The empire was dissolved at the death of Malek Shad, his sons divided and disputed the provinces of Persia; minor branches ruled in Kerman, Anatolia, and Syria; and when Sandjar, the youngest and most warlike of the sons of Malek Shah, succeeded, about 1120, in establishing his own supremacy over most of the eastern parts, the provinces of Azerbaijan, Fars, Laristan, &c., were virtually independent under petty princes bearing the Turkish title of alabek, who, from being lieutenants of the sultan, had aspired to here a mountain country immediately infamous sect of Islamists, or Assisted from the time of Malek Sandjar (1156) civil wars recurred, jokkian princes, of which the Persians recover from them the excursions in Iraq; and though the remaining provinces, he was Jokkian empire, the viceroy of the conqueror for a subduing Trans-Oxiana subdued the yoke of the Khan a few years later, in 1182, supplanted the Ghaznives from the Caspian to the Persian Gulf. But Mohammed, the host of 700,000Gengis,-Khans, to take revenge in 1220, on the palpable guilt of his son for the sole destruction of the whole country.

[Image of an eagle and text that is not legible]
supplied with fruits and provisions, and some large and well built houses; the population is 2000. Left, on the northern coast, on the channel which divides the island from the continent, was once the resort of pirates, but is now nearly abandoned. At Bassetoh, or Bassadore, not far from the western extremity of the island, the East India Company had an establishment during the survey made by them of the gulf (from 1821 to 1829). Rice is cultivated, and date-trees are numerous. The island of Kaes or, Kenil, is small, the area hardly exceeding five square miles, but it is well cultivated, and has a town, and a harbour for native vessels, which is frequently resorted to. The island of Busheb contains about forty square miles. It is uncultivated, but produces dates, and abounds in goats and sheep. It is the eastern end on the north side, where there is good anchorage for vessels of large burthen. The island of Kerej or Kharrack contains about 26 square miles, and is surrounded by reefs, except at its north-eastern extremity. It is elevated and hilly at a considerable distance. The date-groves are extensive, and there is abundance of good water. Vessels sailing to Bassora obtain pilots here, who conduct them through the dangerous shoals at the mouth of the Shat-el-Arab.

A fleet along the shores of the gulf; and fish and dates constitute the principal articles of food of the population. Nearly the whole population of the Arabian shores of this sea get their means of subsistence by the pearl-fishery. The most extensive pearl-fishery is on those on the coast south of Basra. The island of Busheb contains about forty acres, and on the coast near the eastern end on the north side, where there is good anchorage for vessels of large burthen. The island of Kerej or Kharrack contains about 26 square miles, and is surrounded by reefs, except at its north-eastern extremity. It is elevated and hilly at a considerable distance. The date-groves are extensive, and there is abundance of good water. Vessels sailing to Bassora obtain pilots here, who conduct them through the dangerous shoals at the mouth of the Shat-el-Arab.

The shores of the gulf are low, except near the Strait of Ormuz, where the mountains on both sides of Ras Mussemdoun rise to a considerable elevation, and come close up to the sea. This high coast extends within the gulf about 70 miles, as the bird flies. The coast is sandy, but the water is too deep to make fishing for them either very profitable or easy near that island. At Bahrein alone the annual amount of the pearl fishery may be reckoned at from 1,000,000 to 1,200,000 German crowns (the cowan being about 800 crowns). In this vicinity, the islands of Busheb and Kerej are rich in pearls, and some are found on the coast near the eastern end on the north side, where there is good anchorage for vessels of large burthen. The smaller fisheries, at Abobotha, Sharga, Basel-Khiva, may produce half that sum, so that the whole produce may be between 300,000, and 360,000 crowns. About 1500 boats are employed in this fishery, and each contains ten persons, five days' bread, and a week's provisions.

The shallow, sandy and shelly coast increases from east to west, and the coastal belt becomes oblong, broad, and sandy, and can be swampland, but exceedingly hot. It produces very little grain, but is abundant in dates, and is called the Date Palms of Switzerland, which is the Diospyros Lotus. Persia, Aulus Flaccus, a Roman satirist, was born at Volaterra, a town of Etruria, about the 18th year of the reign of Tiberius, i.e. 34 B.C. He was of equestrian rank. At the early age of six years he lost his father. His mother, who was afterwards married to another Roman knight, appears to have bestowed extraordinary care upon Persius; and he appears to have shown towards her the strongest filial affection.

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The materials for a life of Persius are scanty; but they are sufficient to show him in a very favourable light. Amidst prevailing corruption, he maintained a high moral character. He was a wiser and more philosophical philosopher than his contemporaries. He sought to purify his mind of the errors of his age, and to raise himself to the purposes of self-discipline. His acquaintance with men and things was the result of private study more than of actual converse with the world, so that, as his writings testify, he viewed human life as he thought it should be, rather than as it really was. Different opinions are

of the gulf, which is also called Arabia; but on the northern shore they occupy only the Dushmanian, or low plain; the mountains at the back of it, as well as the table-land of Iran, which lies behind these mountains, being in possession of the Persians. As the low plain is inhabited exclusively by Arabsians, one of the sovereigns of Arabia, the iman of Muscat, has succeeded in establishing his authority over nearly the whole extent of it, as least as far west as Basrdistan, and the king of Persia has left him in possession of it, but the iman pays him an annual rent. The eastern coast and mountains of this gulf, which is on record as the voyage of NAURUS (Horsburgh's India Directory; Kinneir's Geographical Memoir of the Persian Empire; Berghius, Geo. Hydrographe, 1703; Ypperley's Memoirs of the East India Company; a Survey made on a Survey along the Eastern Shores of the Persian Gulf, in the Lond. Geogr. Journal, vol. v.; Wilson's 'Memorandum respecting the Pearl Fisheries in the Persian Gulf,' in the Lond. Geogr. Journ., vol. iii.; Whitelock's 'A Descriptive Sketch of the Islands and Coast situated at the Entrance of the Persian Gulf,' in the Lond. Geogr. Journal, vol. viii.)

PERSICA. [Flach.]
PERSICARIA is the garden name of a species of Polygonum (P. orientalis) having handsome annual, growing about six feet high, and strikingly ornamented with drooping clusters of pink flowers. It is very different from the Polygonum Persicaria, a wild acrid plant, growing in ditches, and of no great beauty.

PERSICOLl SCHOENHUTNER'S name for one of the Marigoldinae. [Vontularia.]
PERSIMON is the fruit of the Diospyros Virginiania, a tree inhabiting the United States of America, especially the southern, where it becomes 60 feet or more in height, with a trunk 18 or 20 inches in diameter. It has ovate-oblong taper-pointed shining leaves, pale yellow flowers, and a succulent reddish fruit about as large as a small plum, and containing a few oval stones. After having been exposed to the sun for some time, it is sweet and juicy, like our苹果, and is much used in the family of the adzuki bean. Its timber is very strong, elastic, and of considerable value. The bark, which is very bitter, is said to be tonic. In Great Britain it has long been cultivated, and there are fine specimens at Kew, London, and elsewhere. Its fruit is however not very esteemed. The Persimmon is very nearly the same as the Loire or Date Plum of Switzerland, which is the Diospyros Lotus.
formed of Persius as a satirical poet. Quintilian and Martial, with some of the early Christian writers, bear a high testimony to his merits, as do likewise several modern critics. Others consider him not worth reading. Gifford, who has studied him thoroughly, says, among many eulogies of him, "he liked the satire more than the unalloyed pleasure; virtue he recommends, he practised in the fullest extent; and at an age when few have acquired a determinate character, he left behind him an established reputation for genius, learning, and worth.

The works of Persius consist of six Satires with a prologue, which seems however not a very suitable introduction either to the first satire or to the six satires taken as one work. The metre of this prologue, which comprises 14 lines, is of the kind called choliambic (lame iambic), or sean (which kind is seven of the poems of Catullus). The Satires contain altogether only 650 hexameters; and in some manuscripts they are given as one continuous work. Whether Persius wrote more than we now possess, as the author of his life attributed to Suetonius and Martial speak of his claims to distinction, though he left only one book, we should conclude that no other production of his was known in their time.

Much has been said respecting the obscurity of Persius, and it has even been stated that he meant not to be easily understood. It is not very likely that a man ever wrote seriously with the intention of being obscure. It is granted that Persius is obscure; but he was, no doubt, plain enough to his contemporaries, who were acquainted with the principles of the Stoic philosophy, and with the persons and things generally referred to. Modern readers without such a key will of course find difficulties in Persius. Commentators have overthrown much light upon this author, and among them Isaac Casaubon may be mentioned first; but his comment is copious enough to frighten most readers of the present day. The comment of Koenig is brief. "That of Bond may be recommended as the best, particularly because it comes directly to the point, and brings forward sketch-like forms of others, which other writers write in such a way as greatly to illustrate the phraseology of Persius." The English reader may derive a correct idea of Persius from the translation and notes of Gifford.

The best editions of Persius are those of Isaac Casaubon, printed for him by his son Marc, London, 1646, Bond, Norh, 1651; Koenig, Gött, 1803, and with Rupert's Juvenal, Glasc, 1825. English translations have been made by Holyday, Dryden, Bewer, Sir Wm. Drummond, and Gifford. (Life of Persius attributed to Suetonius; Fabricius's Historiarum Romanarum; Rupert; Koenig and Gifford.)

PERSONAL ACTIONS [ACTIONS.]
PERSONALTY AND PERSONAL PROPERT.

[CHATELS]

PERSPECTIVE, a term popularly given to an application of geometrical principles, by means of which a pictorial outline of a certain class of objects may be delineated on a plane surface. It is consequently connected with the arts of design. [DRAWING.] Perspective constitutes however only a specific case of a more general application of the principles alluded to, which enable us to make constructions relating to geometrical solids, bearing the same relation to geometry of three dimensions that practical bears to theoretical plane geometry.

The analyst, in his investigations of symbolical expressions for the relations of geometrical magnitudes, refers these, according to the species of magnitudes under consideration, either to coordinate lines on a plane, or to coordinate planes, assumed at pleasure in space. [COORDINATES.] The draughtsman, or practical geometrist, who makes constructions on the lines and figures themselves, when they lie wholly in one plane; and when he has to make constructions on geometrical solids, he is compelled to refer the various points, lines, and figures connected with or constituting those solids, to co-ordinate planes, or coordinate points, and from constructions on these planes he can determine the unknown quantities of the original solids by means of their projections, as they are termed, knowing the conditions under which these projections were obtained.

1. The series of points of any geometrical solid are most simply supposed to be referred to a plane by parallel right lines, passing through them perpendicular to the plane; the intersections of these lines with the plane are termed the projections of the original points on that plane.

2. Let us conventionally designate the original points by Roman capitals, and their projections by Roman letters thus: P represents a point in space, p its projection on a plane.

3. The points I, m, n, on a plane AY, are understood as referring to points in space, situated along right lines passing through I, m, n respectively, perpendicular to that plane; but these projections alone do not define relations between the original points; for I, m, n are the projections of an infinite number of original points all in straight through which each projecting line may pass. To define the specific points L, M, N, we must consequently not only have I, m, n, but the lengths respectively of the projecting lines LI, MM, NN, or the distances of L, M, N are respectively situated from their projections.

4. This second series of essential data is furnished by the projections L, M, N of the original points on a second ordinate plane BYZ, perpendicular to the first, and therefore parallel to the former projecting lines, by which I, m, n will commence, will converge with the coordinate planes parallel to the projecting lines by which L, M, N are determined. For if a third plane be conceived to pass through the two projecting lines LI, LI of any point L, and therefore necessarily perpendicular to the two coordinate planes, the intersections of this third plane with the two lines, together with the two projecting lines themselves form a rectangle; consequently the distance of any projection from the common intersection YZ of the coordinate planes is equal to the length of the projecting line LI, which is parallel to it; while conversely, the distance of the projection L of the same point L from the common coordinate intersection is equal to the length of the projecting line LI.

5. Let us designate the third plane just described as the projecting plane of an original point. It follows as a corollary from this definition of the plane, that the projecting planes of a series of points L, M, N are parallel to one another, and perpendicular to both coordinate planes, as therefore to the common intersection YZ of their coordinate planes.

6. Let YZ always designate the common intersection of the two coordinate planes; let the projections L, M, N, termed the plane, and the projections I, m, n, the elevations of the original points L, M, N. It follows that the original point lies in either co-ordinate plane, its projection on the plane of that plane, and its projection on the other will be a point in YZ.

7. Let us next consider a right line I.M, supposed to pass through two points in space L, M. Then the line I.M, joining or passing through the planes of L and M, is called the plane of L.M, and is the elevation of some original line.

8. It is obvious, from the preceding definitions, that the plan and elevation of any original right line L.M is the line I.M, joining or passing through the planes of L and M, and project by which I.M is produced, as the common projecting plane. But the reader must not confound the projecting plane of an original point, which is necessarily perpendicular to both coordinate planes, with the present.
10. Besides the plan and elevation, there are two other elements regarding an original line which it is necessary to consider; these are the points in which that line itself intersects the two co-ordinate planes. The principles of projection furnish us with the following theorems relating to these points, and to the plan and elevation of the line.

11. Let the original line be parallel to both co-ordinate planes, it can intersect neither, and both its plan and elevation are parallel to YZ. It is clear, on this supposition, that the original line is itself also parallel to YZ.

12. If the original line be perpendicular to one, and therefore parallel to the other co-ordinate plane, since its projection on that other plane will be parallel to the original, and perpendicular to YZ, while the projection on the first will be a point, that in which the original line itself intersects that co-ordinate plane.

13. If the original line be oblique to one, and yet parallel to the other co-ordinate plane, its projection on that to which the line is not parallel will be parallel to YZ; while its projection on the co-ordinate plane, to which the original is parallel, will cut YZ in the projection of the point in which the original intersects the former co-ordinate plane.

14. If the original line be oblique to both co-ordinate planes, neither its plan nor elevation can be parallel to YZ; the plan of the line will cut YZ in the projection of the point of intersection of the plane parallel to that plane in which its elevation lies; while that elevation will cut YZ in the projection of the intersection of the original with the plane in which the plan lies.

15. It also follows that the projecting line of the point in which an original line intersects either co-ordinate plane coincides with the intersection of the projecting plane of that line.

16. If an original line, oblique to both co-ordinate planes, lie in a plane perpendicular to them both, its plan and elevation will both be perpendicular to YZ; since its two projecting planes will coincide with that in which the line lies. In this case the plan and elevation could not furnish sufficient data for determining the original lines, since they would be common to every line, in the perpendicular plane, which was not parallel to either plane of projection; if however we have, in addition to the indefinite plan and elevation of the line, those of two points in it, or the two points in which the original line cuts the two co-ordinate planes, then the original line is determined.

17. Let us next consider what manner an original line may be conceived to be referred to two co-ordinate planes. It is clear that as only one plane can be drawn through a straight line and a point, or, which is the same thing, through the two legs of a plane angle, the planes and elevations of any two lines through which the plane passes will determine it. But the intersections of the original plane with the two co-ordinate planes furnish a datum regarding it of more direct application.

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18. The intersections of an original plane with the co-ordinate planes are termed its traces.

19. The traces of a plane on either co-ordinate plane will obviously pass through the points in which two or more lines lying in the original plane intersect that co-ordinate plane.

20. If an original plane be parallel to one co-ordinate plane, its trace on the other will be parallel to YZ.

21. If an original plane be perpendicular to either co-ordinate plane, its trace on the other will be perpendicular to YZ, at the point which is the determination of that trace by the line through the original plane intersected by the co-ordinate plane. If an original plane be perpendicular to a co-ordinate plane, its trace on that plane will be the common intersection of lines in the original plane, and will pass through the projection of all points in that original plane.

22. If the original plane be parallel to YZ, its traces on the co-ordinate planes will both be parallel to YZ, and therefore perpendicular to each other.

23. If two original planes are intersected by the traces of lines which will be parallel, as will also be their elevations; but the plans or the elevations only of two lines may be parallel, although the lines themselves are not so, the parallelism of either the plans or elevations simply arising from the accidental parallelism of the plan or elevation projecting planes of the original lines.

24. An analogous theorem applies to two original planes; if these be parallel, their traces on both co-ordinate planes will be parallel; but if their traces are parallel on one plane only, it simply indicates that the original planes intersect each other in a line parallel to that co-ordinate plane.

25. The planes of two lines may cut one another, as may also the two elevations, and yet the originals may not lie in one plane, and therefore cannot meet each other.

26. If two original lines really intersect, the points in which their lines and elevations cut each other must lie in the projecting plane of the point in which the originals meet.

27. The projections of equal parallel lines will be equal parallels, in the ratios of the projections of the cosine of the angle in which those originals are inclined to the plane of projection, to radius. If two lines forming an angle be parallel to two others, whether lying in the same or different planes, the projections of each two lines will form equal angles.

28. The plane angles, which are the projections of equal angles, will be equal, provided the original angles are similarly placed with respect to the traces of the planes in which those originals lie; or else when the original angles lie in a different plane, the projection of the angle between them, if then the projected angles must be equal to the originals.

29. Hence, since the projection of every parallelogram is a parallelogram (23), the angles of the projection corresponding to the adjacent angles of the original figure will also be complementary to each other.

30. If an original plane and line be mutually perpendicular, the projection of the line will be perpendicular to the trace of the plane on each co-ordinate plane. For since the projecting plane of the line must, on this supposition, be perpendicular to the original plane, and consequently so to its common intersection, which common intersection is the trace of the plane, this projecting plane will cut the co-ordinate plane in a line, namely the projection of the original, perpendicular to the trace of the plane.

31. If a line in an original plane be parallel to a co-ordinate plane, the projection of that line will be parallel to the trace of the plane; and conversely, if the projection of a line situated in a plane be parallel to the trace of that plane, the original line is parallel to the co-ordinate plane in which that trace lies.

32. These theorems on projections would be useless to the practical geometrician so long as the co-ordinate planes were supposed to be fixed in space; inasmuch as it would enable him to make the requisite constructions on the projections, and to determine the unknown magnitudes entering into the original solids by means of the projections of the known ones, he supposes the one co-ordinate plane turned
round on the common intersection YZ till the two planes coincide in one and the same plane: by this supposition the relations to YZ of the lines, points, and traces, on the plane which is supposed to be turned round, remain unaltered; while the principles on which the projections are made allow of the correct interpretation of the new relations which the projections of original points and lines on one plane assume with regard to the projections of the same points and lines on the other plane, when these two co-ordinate planes are supposed to be in one.

32. The same method of bringing two planes into one may be applied, or rather conceived to be applied, to the projecting plane of any original point or line, this projecting plane being supposed turned round on the projection of the line till it coincides with the co-ordinate plane with which it is to say, a construction can be made with the projection of a line founded on this supposition, by which a line may be found representing the original line as brought into the co-ordinate plane; and by an analogous construction, an original plane may be conceived as if turned round on its trace till it coincide with the co-ordinate plane.

33. This principle may be carried still farther: thus a construction can be made, founded on the supposition that an original plane has been turned round on its intersection with another such plane till they coincide, and this compounded plane, if we may use such an expression, has been again turned round on its trace till it has been brought into the common plane of projection.

It must be understood that the practical application of the theory of projections is entirely synthetical, that is, the draughtsman, first drawing a line to represent YZ, proceeds from this simple assumption to draw the projections of certain points and lines of a solid, on which he proceeds to project them into their known, assumed, or given relations to each other, and from their conventional relations to the supposed co-ordinate planes, which may in every case be conceived to be so situated as to facilitate these constructions. Having thus got the projections of known or given lines, he proceeds from these data to ascertain the absolute magnitudes of lines and angles depending on these given ones, by making the constructions alluded to, founded on the supposition of projecting lines and planes being turned round on the projections determined by them, till they coincide with the co-ordinate planes.

35. If a plane be turned round on its intersection with another, a line in the former will make the same angle with that intersection, when the two planes are brought into one, that the line made with that intersection when the planes were in situ. The two lines which are the intersections of the projecting plane of a point (5) with the co-ordinate planes in situ, which lines have been shown to be equal respectively to the projecting lines (4) of that point, will be both perpendicular to YZ, and therefore will coincide in one and the same plane similar to line YZ, when the two co-ordinate planes coincide in one.

36. The two co-ordinate planes in situ form four dihedral angles, and an original point may be situated in any one of these; that is to say, of a system of related original points referred to those planes, some one or more may be in different dihedral angles: it is essential that the learner should know how to assign the relative situation of the original points in space from the relative situation of their planes and elevation to YZ.

37. Let us distinguish the four dihedral angles thus:--

38. Our limits will only admit of two or three examples of elementary constructions to illustrate the subject of projections, referring to the theorem on which each step of the construction is founded.

Given a point P in a given line AP, op, the line, drawn through P perpendicular to the line found.

39. Draw a line PQ through P, perpendicular to the plane of the line, for that of a line parallel to the co-ordinate plane, and lying in the plane sought; then (20) PQ parallel to YZ, will be the elevation of this parallel. The line PQ, PB meets the co-ordinate plane in Q and (13). Q then will be a point in one trace of the plane sought; and since the trace of the perpendicular to the elevation of the line, MM drawn through M perpendicular to AB will be that trace. The same construction, applied, mutatis mutandis, to the other projection of the point, will furnish a point in the horizontal trace of the plane sought, which trace must be drawn through B perpendicular to AP. The two traces thus found will intersect each other in a point of YZ (22).

Given a plane LM, MN, and a point A, to draw a line through the point perpendicular to the plane, and to determine the point in which this line cuts the given plane.

40. Through A draw lines perpendicular to the given traces LM of the indefinite projections of the perpendicular sought (29): from the point A, raise ZY, draw N perpendicular to YZ for the intersection of the other co-ordinate plane of the line-projecting plane of the perpendicular (9); and from L, in which AP cuts ML, draw L perpendicular to YZ; the point L is the elevation of the point in which the plane-projecting plane of the perpendicular cuts the line LM, ML; and as is that on which the same plane cuts the trace MM. Consequent L is the elevation of the intersection of the same plane-projecting plane with the original plane. Nor it is obvious that the point sought must lie in this intersection; consequently the point P, in which AB cuts MN, must be the elevation of the point in which the perpendicular intersects the given plane.

41. The plan of the point may be obtained by drawing P perpendicular to YZ (33), to cut AM, the indefinite plan of the line; or by applying the foregoing construction, mutatis mutandis, to the other projections.

To draw a line through a given point P, to make any proposed angle with a given line AB, AB.

42. If the proposed line is to be parallel to the given one, lines drawn through the projections of the given point, parallel respectively to those of the given line, will be the projections of the sought (29). To be parallel, join P with any two points A, B, take at pleasure in the given line. ABP will therefore be the plane, and adp the elevation of the triangle thus formed. Find the traces, ML, MA, of the plane of this triangle by

* This is the form of conclusion of a proof in solid geometry, and is to be thus interpreted: Given the projections P, P on two co-ordinate planes supposed to be brought into one, of a point P situated in an original line of a solid, the corresponding projections, AP, Ap, are given; to draw the line, drawn which will represent the intersection of a plane with these co-ordinate planes supposed to be brought into one, of a point P, situated in an original line of a solid, the corresponding projections, AP, Ap, are given; to draw the line, drawn which will represent the intersection of a plane with these co-ordinate planes supposed to be brought into one, of a point P, situated in an original line of a solid, the corresponding projections, AP, Ap, are given; to draw the line, drawn which will represent the intersection of a plane with these co-ordinate planes supposed to be brought into one, of a point P, situated in an original line of a solid, the corresponding projections, AP, Ap, are given; to draw the line, drawn which will represent the intersection of a plane with these co-ordinate planes supposed to be brought into one, of a point P, situated in an original line of a solid, the corresponding projections, AP, Ap, are given; to draw the line, drawn which will represent the intersection of a plane with these co-ordinate planes supposed to be brought into one, of a point P, situated in an original line of a solid, the corresponding projections, AP, Ap, are given; to draw the line, drawn which will represent the intersection of a plane with these co-ordinate planes supposed to be brought into one, of a point P, situated in an original line of a solid, the corresponding projections, AP, Ap, are given; to draw the
43. Draw \( MN \) perpendicular to \( YZ \), to cut the traces anywhere at pleasure in points \( M, N \); the line \( MN \), \( n \) is consequently the traces of a plane assumed as perpendicular to both co-ordinate planes (22), and cutting the given plane \( MLn \) in a line, the projections of which, of course, coincide with the traces of the plane. The length of this line, or the real distance between the points \( M, N \), when in art, is obtained by making \( mm^\prime \) in \( YZ \) equal to \( m^\prime M \); then the hypothenuse \( m^\prime n \) is the intersection of the given plane with the assumed plane, brought into the plane of projection by the rotation on \( mn \) of this assumed plane.

44. From \( M \) and \( L \), as centres, with \( m^\prime n \), \( L_n \) for radii respectively, describe arcs cutting in \( n' \). Join \( M'n' \), \( L'n' \); the triangle \( M'n'L' \) consequently (32) represents that portion of the given plane \( M'n'L' \) intercepted between the co-ordinate planes and the line \( M'n \), \( mn \), brought into the co-ordinate plane by being turned round on the trace \( ML \), and by this rotation, bringing the original of the triangle, \( PA'B'pab \), along with it. To draw this triangle as thus brought into the co-ordinate planes, produce \( PB', pb \) to cut the two traces in \( D' \) and \( e' \) respectively, make \( L'e' \) equal to \( L'e' \), join \( D'e' \). In the same manner the lines \( a'D', a'e' \) are obtained, constituting the original triangle as brought into the co-ordinate plane in the manner described.

45. The points \( A, a, B, b, P, p \), lying in the original plane, will describe arcs of circles during the rotation of that plane on its trace: the planes of these circles must obviously be perpendicular to the original plane and to the co-ordinate plane, and consequently cut the co-ordinate lines in lines or traces perpendicular to \( ML \), that of the original plane. Hence if lines be drawn through \( A, B, \) and \( P, \) perpendicular to \( ML \), they will pass through \( a', b', \) and \( p' \), since the traces of these planes will be the projections of all lines lying in them, and therefore of the circular arcs alluded to (21) in which the points \( a', b', \) and \( p' \) lie. By this means the points \( a', b', \) and \( p' \) may be found, or verified if previously obtained on any other principle.

46. Draw \( p'a' \) to make the proposed angle with \( a'b'p' \); then the plane \( A, a, P, p \), elevation of the point \( a', \) in which the proposed line meets the given one in the given angle, may be determined from \( a' \) by the converse proceeding to that by which \( a', b', \) and \( p' \) were obtained. And lastly, \( P, p \) will be the projections of the line as required.

47. The foregoing construction might have been made with the trace \( Le \) instead of \( LM \); but the triangle, when

† The sides of the triangle may meet the co-ordinate planes in different direc-
dions; the projections of two of these points, through which the same trace must pass, may therefore lie on contrary sides of \( YZ \). The traces of all planes should be drawn immediately extended on each side of the line \( YZ \), or to be conceived as so extended when circumstances do not admit of their being shown.

‡ In the figure, \( p'a' \) is shown as the same line as the side of the assumed tri-
angle, to avoid confusion; but this, obviously, need not be the case.
and correct proportion between the magnitudes of the original and of its representative.

56. It has been shown (26, 27) that the projections of definite right lines, inclined in equal angles to the co-ordinate plane, will be in a constant proportion to the originals; if therefore the three plane right angles forming a solid angle of a rectangular parallelepiped be inclined in equal dihedral angles to the co-ordinate plane, all lines parallel to the three edges of that solid angle will be projected into lines bearing one constant ratio to the originals and forming with each other equal angles, which are the projections of the right ones formed by the original lines.

57. Thus, for example, if the co-ordinate plane be assumed perpendicular to the diagonal of a cube, the projections of the three edges meeting in any one corner of that diagonal will form angles of $120^\circ$ with each other, and the three projections of the edges at one extremity will, respectively, bisect the equal angles formed by those of the edges at the other extremity; while the lines joining the ends of these six equal radii, which lines must obviously form a regular hexagon, will be the projections of the remaining edges of the solid. If the cube is projected into an equilateral rhombus, as ACBF, BCDG, ACDE, BFCG, &c., the sides of which form angles respectively of $120^\circ$ and of $60^\circ$ each. If the side of the cube be unity, the equal projections of those sides will be $\sqrt{3}$, which is equal to the cosine of the angle at which the originals are inclined to the co-ordinate plane. The original diagonals of the three faces, AB, BD, DA, are obviously, from the symmetry and position of the solid, parallel to the co-ordinate plane; their projections are therefore equal to those in the ratio of or each equal to $\sqrt{2}=1.4142\ldots$ If an original solid be made up of rectangular parallelepipeds, having their faces mutually parallel, and the co-ordinate, or plane of projection, be assumed as equally inclined to the three faces forming any of the solid angles, the projections of all its edges, and of all lines parallel to them, would be in the constant ratio of $\sqrt{164}:1$; the dimensions, consequently, of those originals, as measured in the directions of lines which would be isometrically projected, may be set off from any scale of measurement. Thus, if the lines parallel to the edges of the original solids, and a figure or image of the original constructed which would show the three principal series of planes of which that original was composed.

58. The projections of all circles equally inclined to the co-ordinate plane will be similar ellipses; the axes of these ellipses, when representing circles lying in planes parallel to the faces of a cube equally inclined to the co-ordinate plane, will be to each other in the ratio of the diagonals of the rhombus representing the inscribed or circumscribed square or circle. The following simple method of constructing a scale for determining the lengths of the axes of the isometric projection of a circle will be of service to the practical draughtsman.

Construct a right angled triangle, the base and perpendicular of which are in the ratio of the line to the side of the diagonal of a square, as shown in the following diagram. Set off the length of the isometric projection of the circumscribing square of any original circle along the side of this triangle, from the acute angle, and draw a line parallel to the other sides of the triangle from this point. The line parallel to the base of the isometric projection cut off by this line will be the minor and major axes of the ellipse. Since the major axis of the elliptic projection of a circle is always equal to the diameter of that circle (49), the major axis of the isometric projection of a circle is equal to the side of the circumscribing square. Hence the axes of the ellipse and the side of the circumscribing square, when isometrically projected, are as $\sqrt{3}$: $\sqrt{2}$.

59. The projecting lines and planes are assumed perpendicular to the plane of projection; in order to facilitate the construction; but it is obvious that lines not figures may be projected on a plane by parallel projective lines, making any angle with the plane of projection, such projections are termed oblique, but as they are but seldom shown to advantage, they are usually omitted from general references to them; since we shall have occasion to recur to this subject in a subsequent part of this article. The oblique projection of a straight line, figure, or curve, lying wholly in a plane parallel to the co-ordinate plane, will be similar to the original, or equal to each other, and the oblique projections of parallel right lines will be parallels.

60. The oblique projection of a sphere must be an ellipse, for the parallel projecting lines which are tangential to the spherical surface must always form a right cylinder, the oblique section of which must be an ellipse. The major axis of this ellipse will be the intersection with the co-ordinate plane of one perpendicular to it, and passing through the oblique projecting line of the centre of the sphere. This major axis will consequently pass through the perpendicular or ordinary projection of the centre of the sphere. The conjugate axis must clearly be equal to the diameter of the sphere.

61. We must now proceed to show how, by a modification of the principles of projection, an image of an object or plan which is in any way connected with our being or doing may be conveyed to the spectator an idea of its appearance. It is only however to buildings, engines, machines, &c., consisting of strictly geometrical forms, or mere mechanical instruments, that this method can be applied; the projections by which these productions are obtained are as strictly geometrical as those by which we obtain the projections of such objects on co-ordinate planes.

62. Rel to the objects in the surface of an object is seen in the direction of a straight line, supposed to be drawn from that point to the eye, and representing the reflected ray of light by which that point is rendered visible. The rays from every point of that surface will obviously form a geometrical curve, the surface of which, if all the points of any one of these curves which, touching the object, might be supposed prolonged in the same straight direction beyond it, without penetrating its surface. But when considering the subject of outline alone, we need only regard such of the mutual intersections of many of these lines as may be projected on the plane and surface of the object, produced by the intersections of portions of that surface not continuous: and from our limitation of the class of objects, such lines must be either straight, or else geometrical curves; resulting from the mutual intersection of planes and curved surfaces.

63. The general pyramid of rays will therefore be made up of a series of others, having one common vertex, and for their several bases the perimeters of a portion of continuous surface.

64. If we imagine those pyramids of rays cut by a plane, the common section will obviously be an outline of the object as it would present itself to an eye placed at the vertex, each line and point of the section coinciding with the corresponding line and point of the original.

65. A line drawn from the objective of the spectator's eye retina the same relative position, it is immaterial in what direction or at what distance the plane cuts the pyramids of rays; for the lines and points produced at each point of the plane must necessarily coincide with the originals when viewed from this direction; although the angles which, though there would vary for each of its positions. But each of these different outlines would suggest to the mind the same original combination of forms, provided it be viewed from the true vertex, and cannot be a correct representation or image of the object if viewed from any other point.

66. When we revert to the connection between this sub-

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We need hardly aside to the modification of this assertion rendered necessary by the effects of atmospheric reflection. It is evident that the forms and size of objects can be appreciated by the eye not at one time are in the same respect reflected by these effects, which may therefore be neglected in tracing those outlines which can be seen within a distorted image of a building, which, when viewed from a certain fixed point, presents a natural appearance. This distorted image is a correct version of a pyramid of rays supposed to proceed from the building to the points in question, and therefore when viewed from that true vertex, conveys the same impression that the building itself would do.
ject and drawing, in the common acception of the word, we shall point out the precautions that must be taken by the draughtsman, when applying the principles of projec-
tion to the pictorial delineation of objects, to prevent his drawing from appearing distorted when viewed indifferently from other than the correct point, which it must inevitably be on most occasions. But at present, dismissing all con-
siderations of light, vision, and art, we shall proceed to treat this branch of the subject of projections, termed perspective, in a purely geometrical manner.

67. Instead of the simple elements alone, which entered into the constructions for determining lines and points, re-
ferred to a co-ordinate plane, by parallel lines perpendicular to that plane, we have in perspective projection the addi-
tional elements of the convergence of the projecting lines, or rays, intersecting the plane at different angles, depend-
ing conjointly on the distance of their point of convergence from the original lines, and from the plane. This variation in the conditions necessitates a different course of proceeding; in the former kind of projection the object of our construc-
tions was to determine magnitudes; in that we are about to consider, our object is to delineate apparent and not real form.

68. The following definitions are here given to avoid unne-
cessary repetitions. The plane, on which the projection is supposed to be formed, and which is represented by the drawing board or paper on which the constructions are made, will always be termed the plane of the picture.

69. The point of convergence of the rays, or projecting lines, or the vertex of the pyramids of rays, will be desig-
ned as the vertex.

70. The centre of the picture is the point in which a line, through the vertex, perpendicular to the plane of the pic-
ture, meets that plane; and the length of this perpen-
dicular, from the vertex to the centre of the picture, is the distance of the picture or vertex: this term will also be ap-
plied to the line itself when we have occasion to refer to it.

71. The vertical plane is one passing through the vertex, parallel to the plane of the picture.

72. Let XYZ . . . and VTES, in the figure, be the plane of the pictures and convergent plane; V in the figure is the vertex. Let BB" be any straight line taken as an ele-
mentary original object: the rays from every point in BB" will lie in one plane, the intersection, b' b", of which with the plane of the picture will be the indefinite perspective projection or image of BB", intersecting through any original line BB and the vertex will also intersect the vertical plane in a line VD, parallel to b' b". VD is the director of the original line.

73. If the original line BB" were parallel to the plane of the picture and therefore also to the vertical plane, its in-
definite image and director would be parallel to the original line. But if BB" be not parallel to the plane of the picture and vertical plane, it must intersect them both.

74. The point A, in which any original line cuts the plane of the picture and therefore also to the vertical plane, is termed the station point of that original line.

75. If a line VP be supposed to pass through the vertex, parallel to any original line BB", it will cut the plane of the picture, if the latter be not parallel to that plane. This line VP is termed the radial of BB", and the point P, in which this radial cuts the plane of the picture, is the vanishing point of the original line.

76. If any original line pass through the vertex, its radial will coincide with it. But the point at which such a line cuts the plane of the picture will not only be its common intersecting and vanishing points, but also the common image of all points in the original line, and consequently of the entire line itself.

77. It follows from these theorems that the original line, its director, its radial, and its image, all lie in its pro-
jecting plane, and therefore its image must pass through its intersecting and vanishing points; while its director must pass through its intersecting point, and that these four lines must form a parallelogram, unless the original line be par-
allel to the plane of the picture; in which case the director and radial will coincide in one line, lying in the vertical plane, parallel both to the original and to its image.

78. Let us now consider the projection or image of any point B in an original line BB", and the situation of that image in the indefinite one of the line, according to the position of the point B.

79. If B be at A, the intersecting point of BB" (74): B it is its image B'. If B lie in that part of AB which is on the contrary side of the plane of the picture to that on which the vertex is situated, its image b' will lie be-
tween the intersecting and vanishing points, A, P, of the line: and if B be supposed to recede farther and farther on the former side, it will lie in the intersecting point; and, if B advance in the opposite direction, so that the vanishing point is the limit of the succes-
sive images of points, farther and farther distant from the vertex, or it may be considered as the image of an in-
finity distant point in the original line.

80. If the point B' be situated between the intersecting
and station points of the line, its image b' will be on the contrary side of the intersecting point to that on which the vanishing point P is situated; and if B be the station point D of the original line, it can have no image, or its image may be considered as an infinite distance from the vanishing
point in either direction.

81. If the point B' lie on the contrary side of the vertical plane to that on which the plane of the picture is situated, its image b' will lie on the contrary side of the vanishing point to that on which the intersecting point is situated; and, as before, the vanishing point may be considered as the limit of the images in this direction; or as the image of a point in the original line at an infinite distance from the station point in the direction.

82. Let two or more original lines be conceived as lying in an original plane YZ, and suppose a plane W, which will be termed the vanishing plane of the original one, to pass through the vertex parallel to that original plane.

83. The lines YZ, DE, in which an original plane cuts the plane of the picture and the vertical plane, are called the intersecting and station lines, respectively, of that plane; and the lines WP, TVT, in which the vanishing plane cuts the same two planes, are called the vanishing line and parallel of the vertex to the edge of the original plane.

84. The intersecting, station, and vanishing lines, and the parallel of the vertex, are all parallel to each other, these four lines being the mutual intersections of two parallel planes by two other parallel planes.

85. The intersecting and station points (74) of any original lines, lying in one plane, are points in the intersecting and station lines of that plane, and the vanishing points of the same original lines lie in the vanishing line of that plane; for the radii of the originals must lie in the vanishing plane; and, since the radii of the originals and the vanishing lines of the plane in which the vanishing points of these radii must form with each other, and with the par-
allel of the vertex, angles respectively equal to those which the original lines form with each other and with the intersecting or station lines.
83. The perspective projections, or images of any number of original parallels, will be the intersection of parallel lines, parallel to the originals (73), or will be lines passing through the respective intersecting points of those originals (77), and through their common vanishing point; and the points in which the indefinite images of original lines, not parallel, cut one another, will be those of the points in which the images cut one another.

86. It has been shown that the image of a line is parallel to that line's director; if therefore two or more lines have a common station point, and, consequently, a common director, the intersecting points of those lines, or more lines, one director, the images of those lines in either case will be parallel lines; and in these cases only can original lines, not parallel, have parallel images.

87. The ratios which exist between the definite images and the original segments of lines are easily deducible, either geometrically or analytically; but as these theorems do not lead to rules of frequent practical utility, we forbear, with one or two exceptions, entering into them. Let $B^2B'$ represent a finite portion of an original line, bisected by the point $B'$, then the rays $VB^2$, $VB'$, and the radial $VP$ of $B^2B'$ will be harmonic lines; the definite image of the original line will consequently be harmonically divided by the images $B^2$, of $B'$ and $B$ and by the vanishing point $P$. Conversely, if any segment of an indefinite image of a line be bisected in the radical of the original line, between its station point and the original of the image farthest from that station point will be harmonically divided by the originals of the other two points. If the point which bisects a finite line $AB$ be the station point of that line, the image $a'b'$ of $AB$ will be bisected by the vanishing point $P$.

88. If an original finite line $AB$ be parallel to the plane of the picture, its image $a'b'$ will be to $AB$ in the ratio of the distance of the picture (76) to the perpendicular distance of the plane of the picture parallel to the plane of the picture in which the point $A$ is located; and the image $AB$ is equal to the length of the line from the vertex; and if $AB$ be divided by a point $D$ in any ratio, the image $a'b'$ will be divided by $d$, that of $D$ in the same ratio.

89. If an original plane figure be parallel to the plane of the picture, the image of that figure will be similar to the original: its periphery will be that of the original, in the ratio of the distance of the picture to the perpendicular distance of the plane of the original figure from the vertex; and the area of the image will be to that of the original, as the squares of these lines. If these distances of the picture be equal to that of the original parallel plane from the vertex, the image of an original figure in that plane will be equal, as well as similar, to the original: this may occur if the original plane coincides with that of the picture, or if the distances be equal both, and lie between them; or if the vertex be infinitely far and therefore equally distant from both on the same side.

90. If an original plane, or planes, be parallel to the plane of the picture, their vanishing plane will coincide with the vertex plane: no such planes can therefore have any vanishing line.

91. If an original plane, or planes, be perpendicular to the plane of the picture, their vanishing plane will pass through the distance of the picture (70) to the perpendicular distance of the plane of the picture from the vertex: consequently the vanishing line of such planes, or planes, will pass through the centre of the picture.

92. If an original plane pass through the vertex, its vanishing plane will coincide with it; the intersecting and vanishing planes are therefore coincident, as well as the station lines, and parallel of the vertex; and the images of all lines and plane figures, in such an original plane, will coincide in one line, that in which the plane itself cuts the plane of the picture.

5. The intersecting planes of two original planes will form the same dihedral angle that the original planes form with each other, and the line in which the vanishing planes intersect will pass through the vertex and be parallel to that in which the original planes intersect each other; it will, therefore, be the radius of this latter named intersection.

The intersection of the two vanishing planes, or this radial, will cut the plane of the picture in the vanishing point of the intersections of the original planes, which vanishing point will obviously be the intersection of the two vanishing lines determined by the two vanishing planes.

94. It follows, therefore, that the line in which two original planes cut one another will have for its vanishing point in that in which the two vanishing lines of the original planes intersect each other, or that the common intersection of two original planes will be that in which the intersecting lines of those planes cut each other.

95. Every vanishing plane is supposed to have an auxiliary vanishing plane, perpendicular both to itself and to the plane of the picture, and therefore passing through the distance of the picture of the vanishing plane. this auxiliary vanishing plane will cut the plane of the picture in an auxiliary vanishing line perpendicular to the principal one, and passing through its centre, and also perpendicular to the intersecting lines of the original planes. the line in which the auxiliary vanishing plane cuts the principal vanishing plane is termed the principal radical of the original plane, or planes, to which the vanishing plane pertains. this principal radical is obviously perpendicular to the principal vanishing line, and meets it in its centre, which will consequently be the vanishing point of all lines in the original planes perpendicular to their intersecting lines.

96. The principal radical will form, with the distance of the picture and with the auxiliary vanishing line, an angle equal respectively to the complement of the angle, and to the angle itself, which the original planes make with the plane of the picture.

97. The auxiliary radical of any vanishing plane is a line, in the auxiliary vanishing plane, and perpendicular to the principal radical; this auxiliary radical is that of all lines perpendicular to the original planes, the common vanishing point of which is the point in which the auxiliary radical meets the auxiliary vanishing line. This auxiliary vanishing line will intersect the principal radical of every original plane, and the auxiliary radical intersects all the original planes to which the principal vanishing plane is common.

98. The auxiliary vanishing plane, being perpendicular to the original planes, as well as to their vanishing plane, will pass through the auxiliary vanishing point of those planes.

99. If the principal plane, or parallel planes, be perpendicular to the plane of the picture, their principal radical coincides with the distance of the picture. Their auxiliary radicals will be parallel to the distance of the picture, and intersect the auxiliary vanishing lines of all planes, perpendicular to the original planes, will be parallel to each other, and perpendicular to the vanishing line of the original planes.

100. If the image of the plane, or parallel planes, be perpendicular to the plane of the picture, their principal radical coincides with the distance of the picture. Their auxiliary radicals will be parallel to the distance of the picture, and intersect the auxiliary vanishing lines of all planes, perpendicular to the original planes, will be parallel to each other, and perpendicular to the vanishing line of the original planes.

101. If the image of the plane, or parallel planes, be perpendicular to the plane of the picture, their principal radical coincides with the distance of the picture. Their auxiliary radicals will be parallel to the distance of the picture, and intersect the auxiliary vanishing lines of all planes, perpendicular to the original planes, will be parallel to each other, and perpendicular to the vanishing line of the original planes.

102. For if a right conical surface be imagined formed round the auxiliary radical as an axis, having the vertex for its apex, the formed surface will be tangent to the angle the secondary original planes form with the first; the vanishing planes of these secondary original planes will touch that conical surface in a line, which will be the principal radical of each such vanishing plane; and therefore each vanishing plane of these original planes will be in a line tangential to the circular section of the conical surface by that original plane. Again, the point in which these tangents to the circular section cut the intersecting line of the first original plane, will be common to the intersecting lines of the picture of each vanishing plane respectively, or to the vanishing lines as above stated.

103. Constructions can be made, founded on these general principles, to determine the several vanishing points and lines of touch, and also the several vanishing lines and planes of touch, of any number of original planes.
ereal theorems, by which the perspective projection of plane figures, or solids, may be obtained on a plane, taken to represent the plane of the picture, and all other original or vanishing planes brought to coincide with it by being turned round on their intersections with each other, and with the assumed plane of the picture.

104. If an original plane be supposed turned round on its intersecting line till it coincide with the plane of the picture, the relations of lines in the plane to each other, and to the intersecting line, will not be affected by so doing. And if the vanishing plane of that original plane be also turned round on the vanishing line in the same direction, the same observation will apply to the radials of original lines in the original plane, which will preserve their original relative position to that vanishing line; these radials will be therefore parallel to the original lines respectively, when both they and the original lines are brought into the same plane.

103. Since the principal radial is perpendicular to the vanishing line, this radial will coincide with the auxiliary vanishing line when the vanishing plane is brought into the plane of the picture.

106. But if, as frequently occurs, the constructions must be made on the supposition that the original plane has been turned round on its intersecting line in one direction, and the corresponding vanishing plane turned round on its vanishing line in the contrary direction; the radials will not be parallel to the original lines on this supposition, when the two planes coincide in one. These radials must therefore be drawn, making the same angles with the parallel of the vertex and with the auxiliary vanishing line, that the original lines make with the intersecting line, and with lines perpendicular to it.

107. As an example of the application of the foregoing principles, let it be required to draw the perspective projection of a tetrahedron, of a given magnitude, its position with respect to the vertex and the plane of the picture being also given or assumed.

108. Draw YZ* at pleasure, to represent the intersecting line of one plane of the solid; and take any point C for the centre of the picture. Through C draw CV perpendicular to YZ for the auxiliary vanishing line of the plane (95), also draw CV parallel to YZ, and equal to the given distance of the picture (79); this, and the following steps in the construction, being founded on the supposition of the auxiliary vanishing plane (95) being turned round on CV, till it coincide with the plane of the picture. Make the angle CV'C equal to the complement of that at which the plane of the tetrahedron is assumed to be inclined to the plane of the picture (96). VC' will be the principal radial of the plane, and C' the centre of its vanishing line; consequently a line P', parallel to YZ (83), will be the vanishing line. Draw VQ, perpendicular to VC', for the auxiliary radial, cutting VC the auxiliary vanishing line, in Q the auxiliary vanishing point of the plane of the original tetrahedron.

109. Draw ZR parallel to VC for the intersection of the auxiliary vanishing plane with the original one; R therefore, in which ZR meets VQ, will represent the point in which the principal radial meets the original plane.

110. Make CV' in that line equal to CV, and through V' draw a parallel to YZ, which will represent the vertex and its parallel (81) brought into the plane of the picture by the turning of the vanishing plane on the vanishing line P'P.

111. Draw the equilateral triangle ABD for the face of the tetrahedron in its given or assumed position with respect to the intersecting line of its plane and the centre of the picture; this construction implies that the original plane of that face has been turned round on YZ, in the same direction the vanishing plane was turned round in, on P'P. Through V' draw the radials of the sides of the triangle parallel to them, and cutting the vanishing line in P', P'', P'; the vanishing points of those sides; the perspective images of which being drawn through the intersecting and vanishing points of the sides respectively, will form the image a b d of the given face.

112. If the original triangle had been assumed as lying between the intersecting and station lines of its plane, ABC would have been above the former line, and its image a b d below it; if that plane be supposed turned round in the same direction.

If rays be drawn from V' through A, B, and D, they will be found to pass through the images a, b, d of those points, and require must frequently be had to this mode of determining the image of a point in a line, when circumstances prevent the possibility of determining it by means of the image of another line, also passing through the original point. Or if the distances of any points in a line, as A, B, from its intersecting point, be set off from that point along the intersecting line, and the radial of the line be laid off along the vanishing line, from the vanishing point, of the original line; then lines drawn from the former points in the intersecting line to the point in the vanishing line, will cut the image of the original line in those of the points A, D.*

* In this and some subsequent figures, the bracket with a letter to it is intended to signify that letter applies to the point of convergence of the lines thus bracketed; as for example in this figure, Y' refers to the point in which P₀ P₀ and P₀ P₀ would meet. It must be observed also, that reference is in some places made to lines or points, not shown in the figures, to prevent confusion.

* Let Y be the intersecting point of an original line Y', and P its vanishing.
113. By one or other of these principles, the images of any definite right lines, and therefore of any rectilinear figure, may be obtained. For one or more original lines may be always assumed as passing through one or more points the images of which are required; so that the indefinite images of the assumed lines will give those of the points sought, by its intersections with the images of other lines, in which those points lie: and these assumed lines may be so taken as to define the images with more precision, or to obviate the necessity of drawing radials of lines but little inclined to the intersecting lines of the plane in which they lie. ZR is the perpendicular distance of the point in which the auxiliary radials cut the original plane from its intersecting line; R therefore is the centre of the circular section of the intersected surface, and is collinear with (129). Make ZR' in Z'V' equal to ZR; draw VS to meet V', with V', the complement of the angle at which the faces of the tetrahedron are inclined to each other. From R', as a centre, with RS for a radius, describe a circle. Draw lines to touch this circle, parallel respectively to BA, and AD. Through the point p, in which the tangent parallel to AB cuts YZ, and through P, the vanishing point of AB, draw Pp, the vanishing line of the face of the solid meeting the face ABD in AB: and on the same principles Pp1, the vanishing lines of the two remaining faces are found; then Pp, Pp1, in which these vanishing lines intersect each other, will be the vanishing points (94) of the edges of the solid, and lines accordingly drawn from a, b, d, to these points will complete the image of the tetrahedron.

114. Simple is the construction above described, for finding the vanishing lines of planes making any proposed angle with a given plane, it may frequently be avoided by ascertaining ourselves properly of the symmetry of the solid to be represented, which is the case with the tetrahedron, and the section of the plane in which we are to find the image, a, b, d, of one face of the tetrahedron, we might have determined the image of the centre of that face by drawing those of the perpendiculars on each side of the triangle of the solid, and the hexagonal angle drawn through this centre and through Q would be the image of one perpendicular to the plane of the triangle (97): this line would pass through the vertex of the pyramid, or through the angular point in which the other three faces meet, by finding the image of this point, which is easily done by first determining the intersecting point of the perpendicular, and the intersecting line of any plane in which it lies; then lines drawn from a, b, and d to this image would complete the figure.

115. When a vanishing line is obtained, it is frequently requisite to determine its centre and distance, or its principal radial; this is done by the construction employed to determine the vanishing lines P, P1. Thus, to determine the centre, &c. of vanishing line P, draw a parallel to it through the vanishing point of the line, and through the image of the base of the original plane; also draw CV perpendicularly to the vanishing line for its auxiliary one, cutting the former in C' its centre. Make C'V equal to CV', the principal radial; then V'P = VP, VP being drawn, they will be the radials of the three sides, a, b, d, of the face of the solid, and will be found, accordingly, to make angles of 60° with each other (83). The radial VP will also be found equal to VP', these lines representing one and the same line, only brought into the plane of the picture by the rotation of two different vanishing planes on their vanishing lines.

116. The perspective projection of a curve may always be found by means of the images of a sufficient number of points in the original, or by the projection of some inscribed or circumscribed polygon; if the curve be a plane one: in such a case the image of a tangent to the original curve will be a tangent to the image of that curve. For if the image of the tangent meet that of the curve in more than one point, these points must be the images of points in the original curve through which the original tangent curve passes; which is contrary to the supposition. But there are some theorems regarding the perspective projection of a circle, and constructions founded on them, which ought to be well understood by the draughtsman.

117. The rays from the circumference of a circle, or from the centre of a circle, are parallel to the plane of the image, the picture will be a circle, its axis must be parallel to that face of the picture which is the distance of the picture (70) to the distance of the plane of the original circle from the vertex (89).

118. If an original circle do not touch, or cut, the station line of its plane, its image will be an ellipse where the plane of the picture happens to be a constricted one, an exception to which we shall recur on a subsequent occasion. If the station line be a tangent to the circle, its image will be a parabola; and if that line cut the circle, the image will be the opposite branch of an hyperbola, lying on one side of the vanishing line of the original plane (58).

119. Let KNLB be an original circle, AB being the station line (61); the image of the circle will, in this instance, be an ellipse. Draw the diameter CD to the circle, perpendicular to AB, and let G be the point in CD through which the cords of the tangents from all points a AB pass, according to the well known property of the circle. Let V represent the vertex, the vertical plane being supposed to be turned round on the station line AB, till it coincide with the plane of the circle GKL; the direction of the line perpendicular to the station line. Make DB in DR, equal to the tangent to the circle drawn from B; bisect VE in E, a perpendicular, cutting AB in F; on F as a centre, with FB or FB for a radius, intersect AB at A and B, and draw lines through these points and through G; K, L, M will be the originals of the axis of the elliptic image of the given circle, wherever the plane of the picture may be assumed, and at whatever angle that plane and the vertical one are clined to the plane of the circle.

120. If A, B be two points in AB, such that each is in the chord of the tangents from the other point produced, then from the properties of the circle, AE, BE, will be equal respectively to the tangents AN, BL, drawn from those points: since the square on AB is equal to the sum of the squares on AN, BL, or on AE, BE. E therefore lies in the circumference of a circle described on AB as a diameter. Since the entire AYB, made by the directors of AL, BN, is a right angle by construction; the images of AL, BN will be perpendicular to each other, and parallel respectively, to those of the tangents AN, AM; BL, BK having the same stationary points with the chords KL, MN. Again, since AK is symmetrically divided in K and G, and BN in M and G, the line of KL will be bisected by that of G, and the curve MN will be identical in all the images of G (87). If those images are being diameters to the ellipse, mutually bisecting each other, and parallel reciprocally to the tangent which are the images (86) of AN, AM, BK, BL, the curve of KL, MN must be conjugate diameters, and since those diameters are perpendicular to each other, they must be the axes.

121. If V1, the foot of the directorVV, coincided with D, or if VVV1 were in the auxiliary vanishing plane, the perpendicular to V1 would be parallel to AB, and PQ, SK would be the originals of the axes, which accordingly would be
parallel and perpendicular to the intersecting line. But in every other position of \( V' \), with reference to the circle, these axes must be oblique to that intersecting line, while the angles they form with it will vary according to the distance of \( V' \) from \( D \), and according to the length of the directrix \( VD \).

122. The points \( G \) and \( E \) will not be common to two or more concentric circles, the origins of the axes of the elliptic projections of concentric circles will not be in the same straight line, nor will they have the same station points, except in the case of \( V' \) and \( D \) coinciding when the original of the axes will be parallel and perpendicular to \( AB \).

123. If \( AB \) touched or cut the original circle, the origins of the axes, \&c., of the parabolic or hyperbolic projections might be found on the same principles: but as these curves do not often occur in practical perspective drawing, we shall not dwell on the subject.

124. The only solids with curved surfaces that need be considered are, the cylinder, the cone, and the sphere.

125. If a line be conceived to pass through the vertex, parallel to the axis of a cylinder, whether right or oblique, two planes passing through this parallel will touch the cylinder in two lines of its surface, also parallel to its axis, which will be the originals of the straight outline of the perspective projection, or image, of that cylinder.

126. These two tangential planes will cut the plane of the base of the solid, or that of any section of it whatsoever, in two lines, which will be tangents to the curve of that section. And the parallel to the axis through the vertex is obviously the radius of that axis, which, by its intersection with the plane of the picture, will determine the vanishing point of that axis; and this vanishing point, it must be remembered, is the image of the point, in any original plane, cutting the cylinder in which the two tangents to the curve of the section in that plane meet, which have been shown to be the origins of the outline of the solid.

127. If therefore the image of the base or of any section of the cylinder by a plane be obtained, lines drawn tangents to this image through the vanishing point of the axis will give the straight parts of the outline of the solid; these outlines must also be tangents to every other curve which is the image of any section of the original cylinder.

128. If a line pass through the vertex and the apex of a cone, and meet the plane of its base, or any other plane cutting the cone, two lines drawn through the point of intersection tangents to the curve of the section will be the intersections with that plane of two others passing through the vertex and tangential to the surface of the solid, and these two planes will touch the cone in lines which will be the originals of the outline of its image.

129. The ray just mentioned passing through the apex of a cone is analogous to the radial of a cylinder passing through the vertex, the cylinder being considered as a cone, with its apex infinitely distant.

130. If the line through the vertex and the apex of a cone, or the ray of that apex, be parallel to the plane of its base, or of any section, the tangents to the base lying in its plane, or in that of such section, must be drawn parallel to that ray, and the image of the apex will be the vanishing point of these parallel tangents.

131. Let \( C \) be the centre of the picture; \( a \), bisected in \( e \), being given as the image of a diameter, parallel to the plane of the picture, of a sphere \( e \), therefore being the image of its centre (98). Draw an indefinite line through \( C \) and \( e \), and \( CV \) perpendicular to it, equal to the assumed distance of the picture; take any point \( t \) at pleasure in \( C \) E, but as far from \( e \) as convenient; draw \( a3 \) through \( e \) perpendicular to \( C \) E, making \( a3 \), \( a1 \), equal to \( a2 \), \( eb \). Join \( Ve \) and set off its length each way from \( e \) to \( f \) and \( m \) along a line perpendicular to \( C \) E.

132. By this construction \( Im \) is a vanishing line, of which \( e \) is the centre, \( Ve \) equal to its principal radius, and \( C \) E its auxiliary vanishing line (93); \( f \) and \( m \) will obviously be the vanishing points of the diagonals of every square, lying in original planes having \( Im \) for their vanishing line, the sides of that square being parallel and perpendicular to the intersecting line of its plane; accordingly the quadrilateral \( fghi \) is the image of such a square, lying in such a plane, and the line of its being made equal to the given image of a diameter of the sphere, \( a2 \) and \( a1 \) are the images of equal original lines parallel to the picture and equally distant from it, or both lying in a plane parallel to that of the picture. If therefore an ellipse be described in \( fghi \), touching the sides in the points \( a1 \) and \( a2 \), and having its transverse axis in \( C \) E, this ellipse will be the image of an original circle equal to a great one of the sphere, and having its plane parallel to that passing through the vertex and the centre of the sphere, or this original circle may be regarded as the oblique plan, on a plane parallel to the section of the sphere by the vanishing plane, the projecting lines being parallel to the plane of the picture.

133. Draw \( Vn \) perpendicular to \( Ve \), cutting \( eC \) in \( n \), and \( m \) through \( n \) a line perpendicular to \( en \), or having \( e \) also for its auxiliary vanishing line; make \( no, np \), each equal to the auxiliary radial \( Vn \); make \( er, es \) in \( im \), each equal to the semi-conjugate axis of the ellipse last drawn, and complete the trapezium \( xzxy \) as the image of a square having \( op \) for its vanishing line, and its sides parallel and perpendicular to the intersecting line of its plane. An ellipse inscribed in \( xzxy \), having its transverse axis in \( en \), will be the outline of the sphere.

134. For \( n \) being the auxiliary vanishing point of the plane of the original of \( fghi \), \( op \) is the vanishing line of all planes perpendicular to that original plane, and intersecting it in lines parallel to the plane of the picture. The original square of the quadrilateral \( xzxy \) is therefore perpendicular to the plane of the original of \( fghi \), or to the vanishing plane passing through the vertex and centre of the sphere. Now it will be seen that the conjugate axis of the ellipse in \( fghi \) is the oblique plane (59) of the chord of the tangents from the vertex to the section of the sphere by the vanishing plane, which chord of the tangents must be a diameter of the small circle of the solid, constituting the original of its apparent outline; this small circle being the base of the cone of rays tangential to its surface (62), and having its plane perpendicular to that of the vanishing plane passing through the vertex and centre of the sphere; \( xzxy \) is consequently the image of the square circumscribing the circular base, and the inscribed ellipse that of the circle itself, or this ellipse is the outline of the sphere.

* The points \( ra, sb \) are not the same, though they cannot be distinguished in the figure.

P. C. No. 110;
135. If the distance of the vertex (50) be supposed to be indefinitely great, compared to the magnitude of the object to be represented, the pyramid of rays may be conceived to become a prism, or the rays to be parallel. On this supposition the vanishing points of the lines of the original object would be indefinitely distant from the centre of the picture, and the images of parallel original lines would be parallels. The isometric projection of a parallelepiped (57) is obviously a limited case of this kind, the limitation being necessary from the object in view, which induces us to adopt that kind of projection. But there are occasions on which it is desirable to distinguish rectilinear objects pictorially, which from their small relative size, and from other considerations, do not require the application of perspective projection, and which would not be adequately represented by an isometric one. In such cases the draughtsman may readily accomplish his purpose by combining the principles of projection on coordinate planes with perspective, as in the following example.

136. Let a hexagonal figure, abdefg, be drawn, with the condition that each pair of opposite sides shall be parallel, and consequently equal; from the angles a,c,f draw lines parallel to the alternate sides, and meeting in a point d, and from the intermediate angles, e.g., draw lines parallel to the remaining sides respectively, and meeting in A. The figure thus formed will be the orthographic or orthogonal projection of a cube, under certain unknown conditions of inclination of the plane of projection to the projecting lines, and of these to the original planes of the solid.

137. The projections of the centres of each face of the cube, as q, may be found by drawing the diagonals, as ac, bd, and if lines be drawn through the centres of each pair of opposite faces, as dp, which lines will obviously be parallel to the edges of the solid, and perpendicular to the planes of the faces, they will pass through the vertices of right pyramids placed on each face. By making the altitude of these pyramids, as gp, equal to half the projection of the parallel edges of one of the solid, we obtain the remaining angles, l, m, n, o, p, r, of the solid term a rhomboidal tetrahedron, one diagonal of each face of which is one edge of the original cube.

138. By previously constructing the projection of a cube in the manner just described, the sides of which will furnish a scale of the ratio of the projections of any lines parallel to the edges of that cube, the projection of any parallelepiped may be obtained, and from this again the image of any symmetrical solid deduced. In this manner the forms of crystals can be drawn with the most accurate and most distinct conception obtained of them and of the relative position of their planes. And by analogous constructions diagrams of the theorems of solid geometry may be drawn, which would greatly facilitate the study of analytical geometry.

139. It has been stated that perspective projection is principally employed to furnish a pictorial outline of a building, machine, &c., or to convey an idea of an object of that description to the spectator, but to do this the perspective outline must exist in his mind and be known to it and be excited by the object itself, when viewed from a given point. But there are limitations to the apparent forms of objects, arising from the structure of the eye and the laws of vision, which the draughtsman must never lose sight of; when he practically applies the purely geometrical principles we have assumed, or otherwise he may produce an accurate projection of an object which would be perfectly unintelligible to an ordinary spectator, as the outline of a sphere, deduced in the preceding example, would be to an uninitiated eye.

140. Since the eye can only embrace at one time a very limited field of view, in order to see the whole of an object without changing the position of the eye, the latter must not necessarily come to rest in that position, for otherwise he would have to turn his head to see the successive parts, and at each such change of position the apparent forms of those parts just escaping from his view were undergo a considerable modification, arising from the mere change of position of the eye. For example, in the case of these modifications, owing to the habits and the result of the judgment, which induce us unconsciously to assign the real and constant forms we know the parts of the object to assume their forms as these parts are seen. Indeed it requires a considerable degree of abstraction and education of the eye to make the mind cognisant of the fact, that it is never the form of an object that presents itself, a truth familiar to artists, who know that persons who have drawn an object before them by eye, invariably draw as they know it to be, and not as they really see it.

141. We have stated that the perspective projection of an object is rarely viewed from the precise point from which it was sought to be viewed; but this projection may suggest the ideas of the original forms, wherein they were deduced; consequently the outlines should not in any part deviate greatly from what we may call the average form under which the true one would present itself to the eye, and is the result that observers assume their point of view, or vertex, at such a projected distance from the object itself, or from the imaginary one, that the rays from the points of it farthest apart, may not contain an angle greater than 60° at most, and, if circumstances allow it, of not more than 40°. In short, the pyramid of rays from an object to the vertex should be included within a cone the angle at the apex of which is not greater than that above named.

142. The distance of the vertex from the object has determined these considerations, and its position with respect to the various parts of the original object determined by the conditions of the kind of view of that object it is supposed to delineate, the position of the plane of the picture, generally speaking, being perpendicular to the sides of the cone or pyramid of rays before alluded to, but the principles must determine more accurately its situation.

143. From the frequency of their occurrence under circumstances favourable for the observation, the eye is always turned to the part between two series of long parallel lines, as in streets, aisles of cathedrals, long streets of trees, or walls, &c., but perpendicular parallel lines are rarely if ever long enough to cause this optical effect. Now we have proved that the projections of parallel lines are extremely long, and, if objects, we obtain the same result in the case of the picture; if therefore the draughtsman were so bold as to assume that plane not parallel to the vertical lines of a building or the convergence of the projections of these lines wouldn't let the eye of a person looking at his drawing, as being at such a place not see the street of parallel streets or lines in question, but even with his daily unscrutinizing view. But there is another optical phenomenon guarding the appearance of long parallel lines, which must briefly allude to, because it throws considerable light on the theory of perspective. These lines are not seen by the eye, which forms are functions of the eye, solely under which the original forms are seen, and figures on a plane, resulting from the section by that part of the pyramid of rays from those original forms, are such that these forms are functions of the areas subtending these angles.

144. If a spectator stand opposite two or more long horizontal parallel lines, as those of the façade of a long basilica or of a garden wall, for example, he very palpably perceives that he only sees a part of them, and that the appearance of these varies, as they recede from him to the right and left, reflection, he is therefore convinced that the apparent form of the really parallel straight lines are curves, produced by the varying angles under which the equal ordinates between the parallels are seen, as they become more and more distant from the eye.

145. The parallel projections of such long horizontal lines, which would result from the plane of the picture being
assumed parallel to the originals, would assume their natural apparent curvature, if viewed from the correct vertex; but if not, their parallelism would offend the eye as being at variance with daily experience, and still more would any attempt to draw on a plane the apparent curvature of the lines in question be reprehended as being contrary to the verdict of the judgment, which decides that the originals, being straight lines, ought not to be represented by curves.

146. The draughtsman consequently must never assume his planes to be parallel to the longest side of a building, &c., however much he may be tempted to do so from the facility of making his constructions under this condition, when the projections of such a side would sub- tend at the vertex an angle of more than 15° or 20°.

147. Keeping these conditions in view, the draughtsman may assume the distance of his picture, or its distance from the vertex, entirely according to his own convenience, since it is only the absolute magnitude of the image or projection which is altered by the different distances of the picture; the figure of the image being similar on all parallel planes, as long as the vertex and object remain the same. For the sake of facility of construction, he will generally assume his plane of the picture as coinciding with some principal vertical line of the object or model.

148. The shadow of any object is obviously the projection of it on a surface, by converging or parallel lines or rays, according as the luminary is supposed to be at a finite or at an infinite distance, as the sun may be considered to be as regards terrestrial objects. When therefore he has determined the projection of an object by the principles just explained, they will also enable us to obtain the projection of its shadow on one or more planes or surfaces, as supposed to be cast by an artificial light or by the sun; the problem being simply to determine the projection of the intersection of a pyramid or prism of rays passing from a given or assumed point through the points of a projected object.

149. If the object be perspectively projected and the luminary be the sun, the vanishing point of the parallel rays, whose direction must be given or assumed, will represent the sun, since that vanishing point is the image of a point infinitely distant.

150. Although our power of forming correct conceptions of the true form of an object, as derived from a projection or pictorial representation of it, is much increased by the addition of light and shade, and of shadows of the object correctly projected by rules identical with those by which its outline was obtained, yet as soon as we thus approach the domain of a higher art, that of painting, the mathematical precision of the shadows we should obtain by our rules must yield to more important considerations connected with the arts alluded to. Hence it is that the draughtsman seldom applies the geometrical principles for finding the true shadows of the engine, building, or analogous object, the outline of which he has delineated, for at an early stage of his practice in drawing he ought to have acquired sufficient knowledge of the true art to be able to add his outlines with the effect of light and shade without any gross violation of truth of nature, and with a better pictorial effect than he could ensure by geometrical rules. We shall consequently only give two simple examples relating to the projection of shadows, rather as affording additional illustrations of the principles of projection, than for any practical utility as regards the specific subject of shadows.

151. Let the line CS, c, passing through the centre C, c, of a sphere, be given as the direction of the solar rays; it is proposed to determine the shadow of that sphere on the given plane LM. It is obvious that the problem is to determine the section of the right cylindrical surface, formed by the system of parallel rays, which are tangential to the spherical surface, by the plane LM; and that the great circle of the sphere passing through the points in which these rays touch it will be the base of the cylinder, and the boundary between the illuminated hemisphere and that in shadow.

152. Draw cc', cc', perpendicular to the projections of the ray, and make them respectively equal to the distances of the centre of the sphere from the co-ordinate planes; a', a', drawn through the points in which the given ray cuts the co-ordinate planes, will represent that ray brought into the co-ordinate planes by the turning round of its projecting planes on its projections; draw a'v', a'v', perpendicular to L, c, making the distance equal to the diameter of the sphere; then lines drawn through a', v', parallel to c, will represent the two rays, touching the surface of the solid and lying in the projecting plane of the given ray brought into the co-ordinate plane along with that ray; these lines will cut CT in QR, the equation to the major axis of the ellipse, being the major axis of the shadow of the sphere on the co-ordinate plane.

The conjugate axisQP will be given by drawing lines parallel to CT tangents to the projection of the sphere: for these two parallel tangents will be the boundaries of the projections of the cylinder of rays. Lines drawn through a', b', parallel to c, will cut CT in the vertices A, B, of the conjugate axis of the elliptic projection of the great circle, separating the illuminated hemisphere from that in shade; a diameter DK to the circular projection of the sphere drawn through c perpendicular to CT, will be the major axis of this ellipse.

153. For the plane of the great circle, of which ADBE is the projection, is obviously by the construction perpendicular to the given ray, and the plane of the circle is cut by the projecting ray CT in the original of AB.
while the diameter $DE$ is the projection of the intersection with the plane of the same great circle, by a plane passing through the given ray $CS, c$, and perpendicular to the plane-projecting plane (9) of the given ray. This perpendicular plane must therefore be the elevation-projecting plane of the given ray.

154. By the same construction applied to the other projection, the elliptic elevation $a'd'e'$, of the circle separating the light and shade on the sphere, and the elliptic shadow of the sphere on the vertical co-ordinate plane, may be obtained.

155. It is clear that in this example the two elliptic outlines of the shadows of the sphere on the co-ordinate planes, must cut $YZ$ in two common points; because the segments of the ellipse on either side of $YZ$ of each outline is the projection on the one co-ordinate plane of that portion of the cylinder of rays which forms on the other co-ordinate plane the portion of the outline of the shadow on the same side of $YZ$. \( L' \), perpendicular to $YZ$, is the trace of the elevation projecting plane of $CS, c'$, or $O$, is the point in which this single plane cuts the trace of the given plane, consequently $LO$ is the plane of the intersection of these two planes, and $T'$ in which this line is cut by the plane of the ray $CS$ is the intersection of that ray, or the given plane; the elevation $T'$ of the same intersection may be obtained by applying the same constructions to other traces and projections.

156. The two pair of parallel planes, which are respectively perpendicular to the co-ordinate planes and therefore to each other, and which are parallel to the given ray, touch the sphere in the points $A, a; B, b; D, d; E, e$. These four planes will be cut by the plane $LMn$ in a parallelogram, the sides of the projections of which must be parallel to those of the ray $CS, c'$, and to the lines $LO, s$. Draw $tL'$ perpendicular to $ol'$, and make $tL'$ equal to $tL$; join $ol'$, which will represent the intersection of the projecting planes with $LMn$; draw lines through $d', e'$, parallel to $c'e'$, and from the points in which these parallels cut $ol'$ draw parallels to $L'$ to cut $c'$; again lines drawn through these last intersecting parallels to $ue'$ will be the two sides of the elevation of the rectangle above mentioned; the parallel tangents at $a$ and $b$ will complete the figure; and $ol$, $ue'$, will cut the opposite sides in the points in which the elliptic outline of the shadow of the sphere will touch those sides, or the points $a, b, c, d$, represent the shadows of $d, e, a, b$.

157. The plan of this parallelogram may be determined in the same manner, or by the other constructions explained for determining the projections on the other co-ordinate planes from those already determined on the first, and which are sufficiently indicated in the figure to render further description of them unnecessary.

158. If $L$ represent a luminous body, and $P$ a point, then by imagining a plane to pass through them, the intersection of that plane with the plane on which the shadow is cast will cut the ray $LP$ in $Q$, the shadow of the point. To determine this intersection, we have only to draw two parallel lines through $L$ and $P$, in any direction, and determine the points $l$ and $p$, or $l', p'$, in which these parallels meet the plane of the shadow: then $l'p'$, $LP$ being drawn, will cut each other in $Q$, the shadow of the point. The a the principle employed in the following construction.

159. Let $abcdefg$ be the perspective projection of a cube, $C$ being the centre of the picture, $CV$ the distance of the picture, $PX$ the vanishing line of the face $abc$, and $YZ$ its intersecting line; while $WX$ is that of the face $efg$, parallel to the former. Let $XY$ and $WZ$ be given as the vanishing and intersecting lines of a plane, on which the shadow of the cube, as cast by the luminous body $a'$ given in position, is to be determined.

160. $XZ$, $XY$, being drawn, will represent the lines in which the plane of the shadow intersects those of the parallel faces of the solid (94). If we suppose planes parallel to that of the picture to pass through the various points of the cube, as $a$, these will intersect the two original planes in lines, as $a$, $a'$, parallel to $YZ$, $ZW$, and a line, $a'd'$, through the point of the cube, parallel to the auxiliary vanishing line, will meet $a'd'$ in the point $a'd'$, which we shall call the oblique projection of the point $a$ on the plane of the shadow. Therefore by drawing lines through the points $a, b, c, d$, parallel to $YZ$, to cut $XZ$ in $a, a', a''$, parallel to $WZ$, through $a, b, c, d$, $L$ will cut lines parallel to $WZ$, drawn through $a, b, c, d$, in the oblique projections of those points on the plane of the shadow, and by referring $efg$, $f', g', ...$ to $WX$, in the same way, we obtain the oblique projections of the other angles of the cube.

161. Since the sides of the cube $ah$, $cd$, $efc$, etc., are parallel, their oblique projections will be parallels (159), consequently the images of these parallels $a'd'$, $c'd'$, $e'f'$, etc., will have a common vanishing point $P'$, in the vanishing line of

* That is to say, $a'$ is the perspective image of the oblique projection of the original point of which $a$ is the perspective image.
the plane in which the oblique projections lie; for the same reason, \( a'd', b'd', c'd', \&c. \) will have a common vanishing point \( P'_2 \) in \( XX' \). Now it is obvious that the vanishing points \( P'_1, P'_2 \), are, by an extension of the principle, the oblique projections on the plane of the shadow of the vanishing points \( P_1, P_2 \) of the original sides of the cube; consequently the former may be determined from the last-named vanishing points by simply drawing lines through them parallel to \( WC \) to cut \( XY \) in \( P_1', P'_2' \).

162. If \( h \) had been given as the image of the point in which a line through the luminary perpendicular to the plane \( YZ \) met the plane, the image of the luminary would be determined by making \( h' \), drawn to the auxiliary vanishing point \( Q \), the image of the given perpendicular height of the luminary above the original plane. A line through \( a' \) parallel to \( WC \) will meet \( OA \) produced in \( a', \) the oblique projection on \( P_1' \) of the point \( a \). A vanishing point \( P'_1 \) on the plane of the shadow may be either determined as those of \( a, b, c, d, \&c. \) were, or by drawing a line, as \( a, d, \&c. \), at pleasure, to cut the vanishing line \( XP \) in some vanishing point; this vanishing point may be transferred to \( XY \) by a parallel to \( CV \); then a line drawn through \( a' \), the oblique projection of \( a \), to this transferred vanishing point, will cut \( P_1' \) produced in \( P' \), the oblique projection of the luminary on the plane of the shadow.

163. Draw lines through \( a' \) and to the oblique projections \( a, b, c, d, \&c. \), intersecting each such line by the luminous ray \( a, b, c, \&c. \) in the shadows \( a', b', c', \&c. \) of the angles of the cube, and these points being joined, the figure thus produced will be the image of the shadow of the cube created by the light.
meridian; and a circle drawn through $H, V, p, p$ will be its image.

173. By these constructions, the meridians and parallels of latitude for a map on the Stereographic projection can be drawn, whether the axis of the globe be parallel or inclined in any proposed angle to the plane of the picture.

174. When the vertex is without the surface of the sphere, all the circles on the surface are projected into right lines or ellipses, and the axes of these ellipses are readily found by the principles of perspective projection: the plane of the picture is assumed, as before, passing through the centre of the sphere, and vertical to the line joining the centre and vertex. Let $EPDQ$ be the circle, formed by the intersection of the plane of the picture with the spherical surface; $CV$ is the assumed distance of the picture, the auxiliary plane being turned round on the auxiliary vanishing line $CM$: $ED, FG$ being the intersections of any given great circle, and of a small one parallel to it, with the auxiliary plane. The planes of these circles being inclined to that of the picture in an angle equal to $MC D$.

175. Through $V$ draw $VC$ parallel to $DE$, to cut the auxiliary vanishing line in $C$, the centre of the vanishing line of the original planes of the given circles, $C^C'$ drawn parallel to $HO$, the intersecting line of the plane will be the vanishing line, and if $C^C'$ be made equal to $CV$, the principal radial, $P$, will be the vanishing point of all lines making angles of $45^\circ$ with the intersecting line; consequently $PA$ drawn through $C$ will be the indefinite image of the diagonal of the square circumscribing the original circle. Draw the rays $VD, VE,$ to cut the auxiliary vanishing line in $d, e$; through these points draw $AB, a b$, parallel to $HO$, and draw $CA, C'B,$ through $H$ and $O$; then the rhombus $ABab$ will be the image of the encircumscribing square; and the elliptic image of the circle will touch its sides in the points $H, o, d,$ and $e$; $de$ is the conjugate axis of this ellipse (121); the major axis will therefore bisect $de$ at right angles. Produce $FG$ to cut $CM$ in $I$, through $I$ I draw a line parallel to $HO$ for the intersecting line of the plane of the given small circle, set off on it each way from $I$ the half of $FG$, then lines drawn through these points thus marked to $C'$, will be the images of the two sides of the circumscribing square which are perpendicular to the intersecting line (95); the images $f, g$, in the other two sides, are found by the rays $VF, VG$; lines through $f$ and $g$ parallel to $HO$ will complete the image of the circumscribing square; the elliptic image must be drawn accordingly to touch its opposite sides in $f, g$, and $n$ being the conjugate axis.

176. Draw the diameter $PP$ perpendicular to $DE$, as the common diameter of a series of meridians, the planes of which are perpendicular to that of the great circle $d H e O$, this common diameter lying in the auxiliary plane, and being brought with it into the plane of the picture; $p, p$ will therefore be the images of the poles of the circles $ED, FG, & c.,$ and the images of all the meridians must consequently pass through these points.

177. The intersecting line of the plane of any of these meridians making any proposed angle, equal to $MQK$, with the auxiliary vanishing plane, may be found by the same construction employed for the same purpose in stereographic projection. Let $ED$ be taken to represent such an intersecting line found by the construction alluded to. Make $CV$, equal to the distance of the vertex, make the angle $CV, CV'$ equal to $MQK$, or to that which the original plane makes with the auxiliary plane, $VC'$ cutting the auxiliary vanishing line $CC'$, produced in $C'$, the centre of the vanishing line of the plane, which vanishing line must accordingly be drawn through $C'$ parallel to $PP$: by means of this vanishing line and its principal radial $VC'$, the image of the circumscribing square can be found, and the ellipse drawn tangent to its sides.

178. The cone of rays from the vertex, tangential to the surface of the sphere, will be cut by the plane of the picture in a circle concentric with $EPDQ$, and the diameter of this outline of the sphere will be found by drawing tangents from $V$ to the circle $EPDQ$, to cut the auxiliary vanishing line in its vertices. Now the elliptic images of all great circles must touch this outline, once the original must touch that of the outline; consequently the major and the elliptic images of such great circles must be diameters of this circular outline: these axes may be determined at the properties of the curve from the data before obtained.

179. When this projection is used for the construction of maps, the opposite concave hemisphere, beyond the plane of the picture, is represented; but if the sphere be intended to be projected as an object, the convex surface towards the vertex and bounded by the visible outline should be drawn.

180. When the vertex is at the centre of the sphere, all great circles are projected into right lines (92), and the small circles are projected into conic sections. Let the circle $AHPD$ represent the intersection of the sphere with a plane passing through the distance of the vertex $VC$...
make with the auxiliary plane $AHOP$, $V$ being radius. Hence the constructions for drawing these meridians are extremely simple.

131. Let $AB$, $ED$, $Sc$, represent parallels of latitude; these will constitute the bases of so many right cones, having the vertex $V$, or the centre of the sphere, for their common vertex, the projections of whose meridians are ellipses, parabolas, or hyperbolae, according as the opposite slant sides of the cones are inclined or parallel to the plane of the picture. The projection of $ED$ will be opposite hyperbolae (118), $a$, $d$ being the vertices of the major axis. If $BV$ be parallel to $p_{d}$, the projection of $AB$ will be a parabola, otherwise an ellipse, provided $VB$ meet the plane of the picture on the same side of $C$ that $VA$ meets it. All these curves will have the auxiliary vanishing line for their common major axis; they can therefore be drawn with facility either by constructions derived immediately from the theorems relating to the curves as sections of the plane, or else points in their projections may be found by the simplest principles of perspective projection.

183. When the circles of the sphere are projected on a plane by lines perpendicular to it, the position of the plane is immaterial, the sections of the cylindrical surfaces formed by the projecting lines being unchanged by any variation in the position of the plane, provided it be vertical to the projecting lines. However, to indicate the analogy between the principles employed in the constructions in this case, and those that have preceded, we shall suppose the plane of the picture, or the co-ordinate plane, to pass through the centre of the sphere.

183. Let $EFGC$ be the great circle that is the intersection of the plane with the solid, and also representing any other which is perpendicular to the co-ordinate plane, supposed to be turned round on their common diameter till they coincide. If $PP'$, supposed to be in a plane perpendicular to that of the projection, be the common intersection of any series of meridians, $P_{n}P'_{n}$, will be the projecting lines (4) of its vertices brought into the co-ordinate plane by the rotation of the plane in which these three lines lie, on $CQ$ its trace (18). The projections of all these meridians must therefore pass through $P$ and $P'$. Now if the same construction be made in this case as was explained in the corresponding problem in the stereographic and globular projections (171), we shall obtain $ED$ as the intersecting line (81) or trace (18) of the plane of a meridian forming any proposed angle $\theta$ in the small circles with the plane, and $ED$ will be the major axis of the elliptic projection of that of that meridian (49); the semi-conjugate is the cosine of the angle at which the plane of the circle is inclined to that of the projection.

184. The other methods of delineating maps, on the supposition of the development of a conical or cylindrical surface, supposed to touch the sphere, are foreign to the subject of projections, and consequently are not here introduced.

**PERSICARIA.** Mr. Swainson's name for a genus of Water-charts (Fluitocineae).

**Generic Character.**—Hill long, compressed on the sides. Nostrils naked. Wings rounded, broad; the scapular quills as long as the primary quills. Tarsi very long, smooth. Tails rather short. (Sw.)


**PER.** [PERTHSHIRE.]

**PERTHSHIRE.** The northern and central county in Scotland, bounded on the north by the shires of Inverness and Aberdeenshire; on the east by Forfarshire; on the south-east by Fifeshire (from which, in one part, it is separated by the Frith, or estuary, of the Tay), and by Kinross-shire; on the west by Clydesdale and Stirlingshire, on the south-west by Stirling and Dumfartion shires; on the west by Argyleshire; and on the north-west by Inverness-shire. The form of the shire is compact; its greatest length from north to south is from the border of Inverness-shire, north by east, to Loch Garry, near Milar Mid; while in the south-west the greatest breadth from east to west is from the border of Forfarshire, between Meigle and Giamis, on the road between Perth and Forfar, and the border of Argyleshire, near Loch Lydoch, 62 miles; or from the border of Fifeshire, near Abernethy, to the border of Argyleshire, north-west of Loch Lomond, which is also about 62 miles. (Map of Scotland, published by the Society for the Diffusion of Useful Knowledge.) A small detached portion of the county lies on the north-west of the Firth of Forth, between the shires of Fifeshire and Clackmannan, and another small detached part is surrounded by Stirlingshire; while a small detached portion of Forfarshire is included in the boundaries of Perthshire. The area of Perthshire is estimated at 2335 square miles, or 1,624,329 English acres. (Plympton's Description of Scotland, M'Culloch, Statistical Account of the British Empire, gives the area at 2286 square miles for the land, and 504 square miles of lochs.) The population in 1801 was 126,366; in 1811, 135,093; in 1821, 135,090; and in 1831, 142,469 (Plympton's Returns), giving an average of 44,362, or 297 inhabitants to a square mile. This population is however very unequally distributed; twenty parishes in the western and northern parts of the county, comprehending about two-thirds of the area of the county, have a population of 44,362, giving from 254 to 28 inhabitants to a square mile. The remaining small but numerous parishes of the south-east the population may be estimated at from 110 to 200 to a square mile. The county lies between 56° 24' and 56° 57' N. lat., and between 3° 26' and 4° 54' W. long. In Perth, the capital of the county, is on the river Tay, in 55° 24' N. lat., 3° 14' W. long.; 43 miles from Edinburgh by Queensferry and Dumfermline, and 442 miles from London.

In The Beauties of Scotland (Edinb. and Lond., 1805-8), and in the Gazetteer of Scotland (Edinburgh, Chambers, 1832), the dimensions and area of the county are exaggerated in a most extraordinary manner; the length (from east to west) and breadth are given at 77 and 68 miles respectively, and the area at 5000 square miles, or 3,200,000 acres.

**Surface and Geographical Character.**—The whole of the county except the immediate vicinity of Perth is hilly, if not mountainous. The Ochill Hills or Mountains traverse the south eastern part between the Forth and the Tay; they rise in some parts to an elevation of more than 2300 feet above the level of the sea. The Grampians form the northern and north-western boundary of the county, separating it from Aberdeenshire and Inverness shires. Glass Miou, Benmore-More, Scarsooch (3350 feet), and Bruch-Carruan are in this part of the county. To the south of the county is overspread by the mountains of the Western Highlands, among which are Ben Venue, Stuch a Chroin (3171 feet), Ben Ledi (2863 feet), Ben Vorlich (3180 feet), Ben More (3919 feet), Ben Lawers (3945 feet), Schillilain or Schiehallion (3413 feet), and Hill of Rona (3521 feet). Cairn Gower in the Ben y Gloc Mountains in Athol Forest, south of the Grampians, has an elevation of 3650 feet. The Sidlaw Hills are on the east side of the county near Forfarshire; Duninnan or Dunislane hill, one of the highest in the county, is 2300 feet above the level of the sea, and nearly 800 feet above its base. Upon its oval and conical summit, 507 feet in length by 267 medium breadth, Macbeth erected his castle. Birnam hill, near Dunkeld, is stated by some authorities to be above 1500 feet high.

These mountainous districts are intersected by long wind- ing narrow vales, or 'glen's, through which the streams flow, or by 'straths,' or wider valleys. Strathtalan in the
south part of the county separates the Ochill Hills from the mountains of the Western Highlands; Strathearn extends across the centre of the county from west to east; Strath Tay, and lower down and branched plumes — an extensive branch — into Forfarshire, or rather through it, form the valley of the Tay; and Strath Airlie is in the north-eastern part of the county. In the northern part of the county are Glen Shee and Glen Beg, Glen Fearnal, Glen Tilt, Glen Bruar, and south and west of these is the land of the water of Lochy, Lochy, Glen Dochart, Glen Falloch, and Glen Artney. Glen Tilt communicates with Strath Tay by the well-known path of Killercarnie. The road here is cut out of the side of one of the contiguous mountains; and below it, at the foot of a high and sharp cliff, in the bottom of the ravine, the river Garry dashes along.

The north-western and northern parts of the county belong to the great primitive district of the north of Scotland. Granite is found underlying the peat of the extensive waste of Rannoch Moor in the west part of the county; but the predominant rock in this district is mica-slate, skirted by clay-slate and chlorite-slate, both which pass insensibly into mica-slate. Schullaben, Ben Lawers, the hills round Loch Tay, and many of the mountains in the Grampians, are covered with intermediate and fine interstratified slate and quartz-rock, and in some parts with a small portion of crystalline limestone. Chlorite-slate is the predominant rock of Craig Calliche, near Killin, intermixed however with a small portion of hornblende; hornblende, with a micaceous schist mixed with hornblende. The rocks about Aberfoyle consist of irregular alternations of grawacke and grawacke slate with clay-slate; the beds are in various positions and elevated to high angles: quarries of fine roofing clay are here. On the mountains near the south end of Loch Catenar, or Catrine, the rocks present an appearance approaching to that of mica-slate. At Ben Ledi the structure still more resembles mica-slate; and beyond this, east of Loch Lubnaig, true mica-slate occurs, and occupies the whole district. This mica-slate is rich in hornblende, and is probably the origin of the greenish, grey, or bluish-green colour of many of the Grampian Hills. (Account of the British Empire.) Some portions of the county near the south-eastern border are comprehended in the coal-field of Fifeshire (M'Culloch, as above); and some authorities mark a narrow district extending south-west from Cowal, at 15 to 17 square miles, or 10,000 acres. Mr. M'Culloch (Statist. Account of the British Empire) gives its surface at 29 square miles, but this we believe to be too great. The banks of the lake are steep and shelving, and the depth of water is supposed to be in some parts not less than 600 feet. It is fed by several mountain streams, and percolates with fish; it has Erich at turn; long narrow stream, and uncommon manner. From the north-eastern or lower end of Loch Tay, the river Tay issues, now under its proper designation, and flows through Strath Tay, or the Vale of Tay. Soon after leaving the loch it is joined by the Linn., and turns south, and then turns east and north, and then north and west, the river Strathmore (or the great "valley"), receives the Isla. From the junction of this stream the Tay turns abruptly to the south-west, south, and south-east, and flows to Perth 12 miles below the junction of the Isla. Its course below Perth is tortuous, and, including the Firth or estuary of Tay, may be estimated at 26 miles; so that its whole length from the head of the Dochart to the open sea may be estimated at 141 miles. Just above Perth, the Tay receives the Almond, and a short river, extending 1 mile E. of Perth, and named the Carry, at a point where the Tay and the Almond run parallel. The Tay is computed to send to the sea a greater volume of water than any other river of Great Britain. Its course above its junction with the Braan is very rapid, but below that point it becomes less so. It is navigable to Perth for 11 miles, and the vessels of one hundred tons, and more, can ascend the upper navigation, for vessels of 500 tons. There is a bar at the mouth, and the navigation is rather difficult, perils from the sand-banks in its channel, and partly from the streight of the tides.

The tributaries of the Tay deserve notice from the system of lakes with which they are connected. The Lyon rises on the western border of the county, and flows east by north through Glen Lyon 28 miles into the Tay. Not far from its source, it flows through Loch Lyon, a small lake about 16 miles long, and with a breadth of 1 mile. Its issues from Loch Lyon, a large irregular sheet of water, the greater part of which is included in the borders of Argyllshire, adjacent to the wild table-land of Rannoch Moor, 1000 feet above the level of the sea. The surface of the lake is perhaps somewhat above 12 miles square. The Tummel issues from its north-eastern end, and flows eastward about 6 miles into Loch Rannoch, passing in its way through one or two smaller lochs. Loch Rannoch is a long narrow sheet of water extending in length 14 miles from north to south by one mile in breadth, partly in Inverness-shire and partly in Perthshire. This lake occupies a hollow which cuts transversely the great Grampian chain, while most of the longer and larger lakes of the county run parallel to that chain, and separate it from subordinate lateral ranges, or these ranges from each other. From the eastern extremity of Loch Rannoch, the Tummel flows eastward 10 miles into Loch Tummel, 2 miles long, west to east and half a mile broad, and from there 12 miles farther east and south into the Tay. Its whole course from its issuing from Loch Lyoch is nearly 40 miles. Between Loch Tummel and the Tay it receives on its left bank the Garry, which has a course of about 30 miles, flows through Loch Garry, a small lake, extending, like Loch Erich, north and south, and waters Glen Garry, in its course through which it receives on its left bank the streams which water Glen Bruar and Glen Tilt, and on its right bank the Feuchine, which rises in Glen Erich. The Braan or Brand, 20 miles long, waters Strath Braan, and serves as an outlet to Lochs Freuchie, Kinnaird, Skiaich, and some others, all small. The Isla, one of the most important streams of the Tay, belongs chiefly to Forfarshire; only about 14 miles of its course are within the border of Perthshire. Of its tributaries, the Shee or Erich belongs to Perthshire; it is nearly 20 miles long, and waters Glen Shee; it receives the Airdie, 20 miles long, which rises at the foot of a narrow range of Gloe mountains, and waters Strath Airdie. The Almond rises not far from the south-east shore of Loch Tay, and
flows about 24 miles east into the Tay. It has no lakes connected with it.

The Earn rises in the western part of the county, and flows east about 5 miles into Loch Earn, which is 7 miles long from east to west, by about one mile broad, and from thence east 35 miles into the Tay below Perth. It was navigable to Dunkeld.

The district of Menteith in the south belongs to the basin of the Forth, and is watered by the Teith, which rises just within Argyleshire, and flows 4 or 5 miles, into Loch Cataner or Katrine, a winding and picturesque sheet of water, nearly 3 miles long, from west to east, and 3 miles east, which has become celebrated as the scene of Sir W. Scott's 'Lady of the Lake.' Trout and char are found in it.

From the south-east corner of Loch Cataner the Teith flows 9 miles through the Trossachs past the village of Callander, where it issues from Loch Voil and Loch Lubaig, which lie north and north-east of Loch Cataner, and each about 5 miles long. From Callander the Teith flows south-east 12 miles into the Forth above Stirling; its whole length is about 34 miles. Pearl mussels were formerly fished in this river to a considerable extent. The Allan, a small feeder of the Forth, waters Strath Allan, and along the Teith, containing the villages of Balmullo, the Devcon, a small feeder, waters the valley on the south-eastern side of the same hills; the Devon, another small feeder, waters the valley on the north-western side of the same hills; and the Forth itself flows just upon or within the southern boundary of the county for about 36 miles, from the neighbourhood of Balfron to 500 acres of land lying on low ground about 1f, trout and some young salmon, and sea-trout are taken occasionally, and various sea-fish are taken in the estuary of the Forth. The Falloch Water, which flows through Glen Falloch into Loch Lomond, is near the south-western border of the county.

The aggregate area of the lakes of Perthshire is estimated at 50 square miles, or 32,000 English acres. The principal of them are nothing more than low valleys between the chains of mountains, in which the river at the foot of the mountain, such as those which Scott has for its waters, spreads itself out so as to assume a stagnating form; hence the lakes are usually of great length, but of moderate breadth.

Loch Tay and Loch Lomond are examples of lochs of this kind. When the margin of the lakes exhibits not a steep ascension, but a gentle slope, it is common for the headwaters of the river to sink, and the shelter afforded by the low situation. (Byrns' Beauties of Scotland.) Scenes of uncommon beauty are then displayed, and the improvements and beauty of such views happily described in his 'Lady of the Lake.' The wood round Lake Cataner is made into charcoal and consumed in the Carron iron-works.

There are several falls in the rivers of Perthshire. Those of the Tern at Dun tar and the Tunnel are very picturesque, and the falls and rapids of the Devon, called the Deil's Mill, the Rumbling Bridge, and the Cauldon Linn, are worth a visit.

Soil: Produce. State of Agriculture. Owing to its mountainous character, a large portion of this county is ill adapted for cultivation. There are very extensive tracts of moor, bog, and moss, though they are progressively diminishing. A large space is occupied either by natural woodlands or by plantations, chiefly the latter, for the antiquity forest. In fact, in the area the Ayshmore and Galloway plantations have been much extended of late years, and many districts have been cleared with them. The late duke of Athol planted about 15,000 acres, of which 2000 acres are in the parish of Blair of Athol, which comprehends the site of the town of Atholl. In the braes of the Forth of Lomond the number of red-deer is very considerable (said to be 7000); the roes and fallow-deer are also numerous in the plantations. The fox, the wild cat, the badger, the otter, the martin, the polecats, the wassel, and the common and the mountain hares and Squirrel are very common, and the eagle has lately made their way into this part of the county, where they are becoming troublesome. The eagle builds his nest on the mountain tops, and the kestrel by the foot of theBruar and in Glen Tilt. Red and black game, the pheasant, the plover, and the partridge are abundant.

The natural wood of Atholl forest consists chiefly of oak, birch, aspen, and alder. Oak ceases to grow as a natural wood at about 400 feet above the level of the sea, at which the region of the birch seems to commence. There are numerous and tolerably extensive woods of birch to the north of Killikranie pass. The alder, which abounds on the banks of the Garry, is dwarfish in its growth. Lime, elm, and plane trees are unusually large and numerous in the park of Blair Castle; and the spurs overlooking the Oak, ash, birch, beech, and elm are also planted, though not so extensively as the fir tribe.

The cultivated land in the county is estimated at from 700,000 to 560,000 acres, 40,000 acres of which are under grass; and the remaining 640,000 acres are under arable. The land is generally very level in the Forth of Firth, and the north of England, is chiefly employed. The chief article of agricultural produce is however the potato, of which great quantities are yearly shipped for London. The sort generally cultivated is the Perthshire red. This crop forms the chief occupation of the farmers; but it has of late years been very precarious, from defect of vegetation in the sets planted. Some good crops of mangel-wurzel have been raised, and the cultivation of the artificial grasses is becoming more common. (New Statistical Account.) The best farmers use a rotation of crops of five or six years, but some keep the land in grass only one year at a time, taking a white crop every alternate year (Ibid., Redgorton Parish.) In the stiff flats of the Cart of Goown the rotation is sometimes of seven years. (Ibid.) Longforgan Parish.) Considerable quantities of apples, pears, and other fruit are raised in the valleys and low grounds, particularly in Gowrie. The use of hedges for enclosures seems to be gaining ground.

There is no breed of cattle peculiar to the county. The stock varies with the varying quality of the pasturage. Many Ayshire cows for the dairy have been introduced of late years into the lowlands; and some of the best farmers have now a cross-breed from the Tweedale or short-horned breeds. (Ibid.) The red-gates of the West Highland breed is that commonly fed on the Highland pastures. The number of sheep has been vastly augmented, chiefly by the alteration in the system of farming, and the laying out of sheep-walks in the pastures. There are considerable flocks of black-faced Tweedale breed, which has displaced the small white or yellow-faced mountain sheep generally kept of old time; but the Tweedals have of late been partially displaced by the Cheviots. There are some flocks of Leicesters and Northumbrians, and the sheep breed of many of the lowland farmers. The Southdowns chiefly belong to the nobility and other large landed proprietors.

Communications. The roads of this county have been improved of late years as much as in any country of Scotland. The road from Edinburgh by Queensferry and Dunfermline to Perth enters the county a few miles south of the last named town. Roads from Dundee, St. Andrews, and from Glasgow, by Stirling, converge at Perth.
From Perth there is a road by Forfar, Brechin, and Stonehaven to Aberdeen; another road follows the valley of the Tay by Dunkeld, and thence those of the Tummel and the Garry, through the pass of Kilkillrakie to Fort Augustus, Inverness, and the Northern Highlands; while a third follows the valley of the Tay and the Dochart into Argyllshire. Three roads lead from Stirling into the Western Highlands through Moray, Argyll, and through Argyll, Loch Lomond, another to Glencoe at the head of Loch Cataner, and another branching from this, joins the traffic through the valley the Tay into Argyllshire.

The only navigable rivers are the Tay and the Forth; the latter is navigable for Stirling for vessels of 70 tons; but its course near that town is so winding that the navigation is little used except for steamers.

A canal has been proposed from the Tay, at Perth, to Crieff and to St. Fillan, at the lower extremity of Loch Earn.

Divisions, Towns, and other Localities.—Perthshire was formerly divided into the six districts of Gowrie (east), Perth (south-east), Stormont (central), Strathearn (central), Mensthy (south), Breadalbane or Braidalban (centre), and central, Balquhidder (south-west), and Rannoch (north-west), each of which was a distinct Stewartry, that is, was in the jurisdiction of a distinct sheriff or steward; but the Act of 1748, abolishing hereditary jurisdictions, put an end to the legal existence of these districts, though the names are still preserved in the titles of the nobility. To these may be added the Highland districts of Athol or Atholl and Athole, in the northern part of the county.

Perth, Turriff, and Cullross, are both royal burghs; Auchterarder, Abernethy, and Dunblane were formerly royal burghs; Dunkeld, Crieff, Longforgan, Cupar, and Alyth are burghs of barony; the other principal towns or villages are Auchtergavie, Blair-Cowrie, Callander, Errol, Doune, Kinnoull, Muthill, Stone, and Kincardine in Tulliallan parish.

Perth is on the right bank of the Tay. It is a place of great antiquity. The name is supposed to be derived from the Celtic Bhair-tatha, 'the height of Tay,' whence Bertha (the town) and the town in the county of Berwick in the east of England. Some have supposed, but apparently through misconception, that Bertha and Perth were different places. The town is said by some to have had a Roman origin, but this is not clear, though two Roman stations, the Ocrea and the Staec of the Picts, and the Ad Taun or Tavun of Richard, were in the neighbourhood. In the New Statistical Account of Scotland it is proposed to identify Perth with the Victoria of Richard, which others fix at Dunkeld, and also with the Earn, where it was for a time the capital of the Picts; it was a burgh in A.D. 1106, and down to the death of James I. (A.D. 1437), was regarded as the capital of Scotland. It was the seat of a considerable trade, which the burgesses carried on in their own vessels with the Hanse Towns; and many Flemings and Germans settled here. The kings of Scotland unwisely subjected these foreigners to many restrictions.

In the war of Edward I. in Scotland, Perth was taken by that king immediately after the defeat of Wallace at Falkirk (A.D. 1298). He restored and strengthened the fortifications, and the town remained in the hands of the English, and was frequently the residence of the kings' deputies till A.D. 1311, when it was surprised and taken by Robert Bruce, and the fortifications were levelled with the ground. For the battle of the Forth, when the English passed the Forth, a distance south of the town, on the Earn (A.D. 1329), by Edward Baliol, who repaired the fortifications, in which he was soon besieged by the Scots, who hoped to reduce him by famine. A victory gained by the English ships stationed at the Forth, called the 'shovellers,' was a day to effectually give over the enterprise. The town was soon after taken by the party of David Bruce, but subsequently reverted to the hands of Baliol and his party, and Edward III. of England was twice at Perth in his expeditions into Scotland (A.D. 1335-36). The Scots in the interest of David Bruce, under the command of Robert, steward of Scotland, afterwards King Robert II., took Perth (A.D. 1339) and entirely crushed the party of Baliol. Many years afterwards (A.D. 1396) the judicial combat took place between two parties of twenty men each from two clans of unacquainted name, which has furnished a striking incident in Sir Walter Scott's 'Fair Maid of Perth.' (Chronicles of the Canon-gate. Second Series.) In 1425, James I. during the sitting of a parliament at Perth, arrested his cousin, the Duke of Albany, excommunicated and imprisoned in the palace, and then caused to be brought to the Earl of Lennox, who, after this event, Edinburgh became the seat of government, though Perth continued to be nominally the capital of the kingdom till A.D. 1402. In A.D. 1512, and in A.D. 1543-44, Perth was visited by the plague. Before the Reformation, there were two monasteries in Perth, a religious house for the monks of the Cistercian order.

In August, 1600, Perth was the scene of that mysterious incident the Gowrie conspiracy to assassinate James VI. (James I. of England.) In 1644 it was taken by Monmouth, after his victory at Tippermuir, and in 1651 was again occupied by the Royalists at Burntisland. It was built a fort near the town to overawe it, which fort, after the Restoration, Charles II. gave to the town. Having fallen into a dilapidated state, the materials were sold, and it was entirely demolished.

The site is now levelled, and a large portion of it are obturated. Perth was occupied by the insurgent Highlanders in the rebellions of 1715 and 1745.

The town is on the right bank of the river Tay, and a line of little headland, called the 'North Inch,' which is not long, over that river with the Bridge-end of Kinneil, when (Bridge-end) is included in the boundary of the modern parliamentary burgh. The streets of Perth are for the most part straight and conveniently laid out, well lighted with street lamps, and are as wide as the streets of similar age to them. The streets are substantial, and those in the environs of the town, which are of later erection than those in the more central parts, are built of freestone, and present a handsome appearance. North and south of the town are two large public greens, called respectively the 'North Inch' and the 'South Inch.' The North Inch contains the race-courses, and the South Inch is surrounded by stately trees and elegant villas. The principal public building is the church of St. John. The square tower is of ancient but unascertained date, and was probably added to the church at the time the town was established. It has been surmounted at a later period by a pyramidal spire of wood covered with lead, and is furnished with bells and chimes. The body of the church has undergone considerable alteration, and is now divided into three parts of different dimensions, each connected with the other and with a high tower.

Three of the three Presbyterian churches of modern erection, one of them especially designed for the Highlanders of the town and its neighbourhood. There are sitting in these churches about 2000 persons. There are also a number of dissenting places of worship of various denominations, containing accommodation for nearly 9000 persons. A handsome building containing the county-hall, courts of justice, and other apartments for county business, of Grecian architecture, faces the Tay. Behind it is the new county goal for felons, misdemeanants, and debtors.

The other public buildings are those of the Academy, a new theatre, a lunatic asylum (one of the most perfect establishments of the kind in Scotland), a range of barracks, and another of government storehouses, formerly used as a depot for French prisoners; Marshall's monument (a building erected to commemorate the services of a late patriot), containing the public library and the museum of the Perthshire Antiquarian Society; the gas-works, and the waterworks. There are two large warehouses, and the buildings now in course of being converted into a prison, in which as improved system of discipline will be adopted, with a view to the reforming of the prisoners, and to the establishment of a model for other places of confinement for offenders, and the desolation of many monuments, of vegetable, vegetable, and animal, of the church of St. John's church; the fish-market on the bank of the Tay below the bridge. The council-hall for the town near the fish-market.

The population of Perth, in 1831, was 26,016. The number of inhabited houses was 2049; of families, 4934; of whom only 53 were returned as engaged in agriculture. The ordinary population was estimated to be at least 12,000 more than the Return, many of the wealthy being absent at bathing places, and many of the poor engaged in sea-faring and fishing work. The number of inhabitants has increased since the Return was made. The manufacture of the place consists principally of coloured cottons, especially...
for umbrellas. A great quantity of handkerchiefs, striped and checked gingham, shawls, scarfs, and trimmings are also made. About 1,600 persons are employed in weaving. A large flax and tow-yarn mill employs above 100 hands; a large bleaching and cotton-printing work at Tullough, in the neighbourhood of Perth, employs 250; and there are other bleaching and print fields, besides three considerable iron-foundries, distilleries, breweries, and corn-mills. The asphaltic clays and barytes, which are coal, lime, salt, and manure, brought costawise; and from foreign parts (chiefly from the Baltic), timber, flax, linseed, clover-seed, corn, bark, hides, small, madder, &c. The exports are chiefly potatoes, sent weekly to London, in quantities of which in January last, registered at 65,000l. per annum; the value in London (freight and other charges being then included) above 100,000l.; the other articles of export are corn, timber, and slates. Nearly 80 vessels (with nearly 5500 aggregate tonnage) are registered at more than 150 tons, but vessels of twice that size have been built at Perth. Great exertions have been made within the last few years to improve the harbour. There are two weekly markets, the principal one on Friday, and there are five yearly fairs.

By the Burgh Reform Act (3 & 4 Will. IV., c. 76), the town was divided into four wards. The town-council consists of a lord provost (who is also sheriff and coronor), a dean of guild, four bailies, a treasurer, and twelve other councilors, and is about the same in being as that of the bailies presides. The property of the burgh is estimated at nearly 70,000l., the debts at nearly 30,000l. There are seven incorporated trades. Before the Parliamentary Reform Act, Perth returned one member in conjunction with Fife, and now sends one by itself. The parliamentary bounds do not comprehend the whole area of the burgh. The police of the city is regulated by a local act, but it is imperfect. The jurisdiction, for the county and the sheriff's court for the division are held in Edinburgh.

Perth has several educational and literary institutions. The "academy" is an endowed institution, comprising a mathematical and scientific school, a grammar school, a school for the education of the poor in the parish, and a drawing school. The reputation of the academy is very considerable. There were, in March, 1837, six other endowed schools, and twenty-two unendowed. The state of instruction among the poor however is very low; a local board has been established, and aided by grants from the lords of the Treasury and from the burgh authorities, for the purpose of erecting schools for 400 children. There is a public circulating library of 8000 volumes, a public news-room, and five private circulating libraries; and there are several weekly newspapers printed in the town. A Literary and Antiquarian Society was established in 1784, which still flourishes, and has a collection of books, manuscripts, coins, objects of natural history, &c.

The charitable institutions include an hospital or almshouse, now disused and let, the rent being distributed in alms; an infirmary, capable of receiving above 50 patients; a dispensary, and several almsgiving societies. There are savings' banks and benefit societies. The poor are further relieved by a parochial assessment, by collections given for the places of worship, and by gifts from the funds of the incorporated trades. The amount distributed in alms is very considerable, and the number of receivers tolerably large.

Crieff is on the northern shore of the Firth of Firth, 23 miles from Edinburgh, and 6 from Dunfermline, in a detached part of the county. It had antiently an abbey of the Cistercians. It was erected into a royal burgh in 1533. At that time it was very prosperous, owing to some coal-works, the produce of which was exported to Holland. These works have been long discontinued. The manufacture of "girdles" or "spok" plates, for baking oat cakes, was formerly very flourishing, but is now discontinued. Crieff has no market, and little trade is carried on. Dunfermline is the mart for the produce. About seventy persons are employed in weaving cotton or linen. There is a small pier for fishing and passage boats, which latter cross the Firth to Borrow-stouness. The population of the parish in 1831, was 1946, of whom less than half were in the town. The church, which antiently formed part of the conventual church of the abbey, is a cruciform ruins, with a massive western tower, in a commanding situation in the higher part of the town. There are some ruins of the former parish church in the parish burial-ground, which is still in use. The parish is well provided with the means of education, and there is a parish library of 200 volumes, another library, and a benefit society for funerals. The corporation was left unattached by the Scotch Burgh Reform Act (3 & 4 Will. IV., c. 76). The council consists of 19 members, including a provost, two bailies, and a treasurer. The magistrates have rarely occasion to exercise their jurisdiction. The town-house is an old building, two rooms of which are appropriated as a provost's and council room. The streets are as broad and commodious as those of Inverkeithing, Dunfermline, Queensferry, and Stirling to return one member to parliament.

Auchterarder is described elsewhere. [AUCHTERARDER.] It was in this parish that the contest, now carried on in Scotland, between is in a commanding situation, and is the finest building in the town. There are three places of worship for Seceder's and one for Catholics. There are a ma...
sons' hall and a weavers' hall. The population of the parish in 1831 was 4766; of whom about four-fifths were in the town. There are nearly 500 handloom weavers, who make cotton-checks and handkerchiefs, linens and worsted stuffs, blankets, plaids, and shawls. There are ten-yards, flour-mills, malthouses, distilleries, two cotton-mills, an oil and a paper mill, and bleach-fields. Tambour-working and other similar occupations are pursued by the females. There are quantities of inferior freestone in the town and the neighbourhood. There are a weekly market and nine yearly fairs. Crief is a borough of barony; a justice of the peace court (or petty session) is held every month for small debts and minor offences; there is also a committee to manage the affairs of the town, but the magistrates and the burgesses assist in its management. In this class of different other similar offences are frequent. There is a prison, or lock-up-house of one cell. There are fifteen schools, four of them Sunday evening schools, and a Sunday evening class for the religious instruction of young men and women.

The county is strung out from Perth on the road to Dundee. It had a population in 1831 of 1638 for the whole parish; of whom about 150 (men and women) were engaged in weaving sheeting, sacking, and linens, and about 20 women and children in winding or other minor occupations, and for the same year, four quarries of excellent freestone in the parish, in which about 60 men are employed. There are a large church, six schools, a library, and a savings' bank. There are three yearly fairs. Near the town are the ruins of an ancient church, the site of the Grudieon of Cuban Angus, and the noble baronial seat of Castle Huntly.

Cupar of Angus is partly in Forfarshire, but chiefly in Perthshire near the right bank of the Isla. Near the town are the traces of Roman camps and the ruins of a rich monastary. The town is neatly built, with clean and well lighted streets; there is a church, an Episcopal chapel, two Dissenting Presbyterian meeting-houses, a town-house, and small gas, or lock-up-house of one cell. Linen-wearing, tailoring, and shoe-making are carried on. There are a weekly market and four or five yearly fairs. The population in 1831 was 2615. Alyth is described elsewhere. [ALYT.] Auchtergaven had in 1831 a population of 3417, a great number of whom were employed in the cotton-works at Stanley, a village partly in the parish. There are quantities of excellent freestone in the parish and a small salmon-fishery. Malt, distilling, and linen-weaving are carried on. There is a parish church, besides a handsome chapel-of-ease, erected by the proprietors of the Stanley cotton-works; a school is also attached to the church. A yeoman of Auchtergaven. Blairgowrie is described elsewhere. [BLAIRGO WRI.] Callander, on the Teith at the junction of the stream from Loch Lubnaig, consists of a wide and clean street, with substantial freestone houses roofed with slate. The population of 1831 is very large, and the village is resorted to by visitors to Loch Catrine and the romantic scenery around. There is a parish church, several inns, three schools, and three libraries. There are several fairs in the year.

Errol is small and mean place, but in a beautiful situation near the Frith of Tay. The church is a modern cruciform building in the Norman style, with a lofty square tower and pinnacles. The population of the parish in 1831 was 2992, about two-thirds of them resident in the village. Stone quarries are worked, and salmon and smelt fishery carried on; but the linen-manufacture is the chief branch of industry: it employs 200 men and 100 women as weavers, besides winders and other assistants. Doune, on the banks of the Allan, is a town remarkable for its handsome Gothic church and tower, of modern erection; a fine old bridge over the Teith; and the ruins of Doune Castle, an ancient fortress of great strength and extent. There are extensive cotton-works at Dunieston, close to the village, and three fair-days in the year.

Doune is in Kilmadock parish, the population of which in 1831 was 3752. Bridge-end of Kinnoul is a suburb of Perth. Methven is a manufacturing village, a few miles west of Perth (pop. of parish, in 1831, 2714) with a commodious parish church, three good schools, a library of 1100 volumes, a friendly or benevolent society, and a savings' bank. Muthill is a clean village, beautifully situated in Strathearn, a short distance from Crieff southward, with a population of 1100 or 1200 (or for the whole parish, in 1831, of 3274). There is a long straight road to Dunkeld, and a weekly market and fair in the town.

The county returns one member to parliament; but the parishes of Tulliallan, Culross, Muckhart, Logie, and Forsewy have been annexed for parliamentary purposes to the shires of Kinross and Clackmannan, in which conjunctive return one member is returned for each. (See Parish Register, 1837.) The greatest number of scholars at all classes at the daily schools in Perthshire between Michaelmas, 1831, and Ladyday, 1834, was estimated at 18,862. (Educational Returns, Scotland, 1837.)

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Historical Events: Antiquities.—In the obscurity that hangs over the geography of ancient Caledonia, little that is certain can be added of the earliest inhabitants of Perthshire. The eastern side was occupied by the Vev-
It afterwards came into the hands of the Scots. In the latter part of the tenth century, the Danes arrived at the mouth of the Esk with a large fleet, and landing, marched to the Tay. They were entirely routed by the Scottish king, Kenneth III., at the battle of Dunbar, probably in a.d. 990. Dunsinnan or Dunsinne Hill, in Collace parish, between Perth and Cupar Angus, was the stronghold of Macbeth, where he was defeated by the English allies of his competitor Malcolm (A.D. 1054). The importance of Perth, and its rank as capital, is shown by the large number of coins found there under many contests. In 1306 Robert Bruce was defeated at Methven, near Perth, by Aymer de Valence, earl of Pembroke, and the English army. In 1332 Edward Balloch, compter of the English army, was killed by David Bruce, on invading force. Chiefly of English, defeated the Scots under the regent, the earl of Mar, at Duplin Moor, on the Earn. He took Perth, where he maintained himself for some time, until his party was finally crushed by the partisans of David Bruce.

In the campaign of Montrose (A.D. 1645) this county was the earliest scene of action. At the head of 1100 ill armed Irish foot and 1300 Highlanders, Montrose defeated 6000 Covenanters, under Lord Etchlo, at Tippermuir near Perth, and gained the loss or capture of 2000 men. The Scottish parliament, which supported the claim of Charles II. to the crown, assembled in 1650 at Perth; and on new-year's day, 1651, Charles II. was crowned with great solemnity at Scone. In the same year Perth was taken by Cromwell, and the royalist party crushed.

In the struggle at the Revolution, A.D. 1689, Perth was taken by surprise by Viscount Dundee, but he soon abandoned the town and retired into the Highlands. On the 17th of July, at the head of about 2200 men, including 300 horse, he was defeated and almost completely dispersed; General Mackay, with the loss of 2000 men; but the death of Dundee, who fell early in the action, prevented any beneficial result of the victory. The Highlanders were re piel in an attack on Dunkeld, where a Cromwellian detachment was posted, and soon afterwards dispersed, and the war came to an end. In the rebellion of 1715-16, a battle was fought on the left side, near Dunblane, between the Highlanders, to the number of 10,000, under the Earl of Mar, and 4000 government troops, under the Duke of Argyll. The battle was won; but the government reaped from it the advantage of victory. The Pretender was for a short time at Scone during the insurrection. In the second Jacobite rebellion, the young Pretender was at Perth in 1745, and the last government troops were dispersed; government troops were blockaded in the castle of Blair Athol by the insurgents under Lord George Murray (March and April, 1746), and relieved, when reduced to extremity, by a royalist detachment from Dunkeld.

The antiquity of the chief relics of the remains of Dunblane and Dunkeld cathedrals; some scanty ecclesiastical remains; some ruins of ancient castles at Moulin, Doune, Kinardine, Kinclaven, and Drummond Castle near Muthill; and some hill forts, Cairns, and Dru-) chional stones at Auchterarder, and some remains of prehistoric man, are the present seat of the duke of Athol.


PERTINAX, PUBLIUS HELVITIUS, born about A.D. 126, at Villa Martis, near Alba Pompeia, now Alba in Piedmont, on the banks of the Tanarus, was the son of a freedman who dealt in charcoal, an important article of fuel in Italy even at that time. At an early age he was sent to Rome to receive a good education, placing him under the tuition of Sulpicius Apollinaris, a celebrated grammatician, who is repeatedly quoted by Aulus Gellius. Pertinax became a proficient in Latin, Greek and the Oriental languages; and after the death of his master, he taught grammar himself. Being satisfied with the small profits of his profession, he entered the army; and being assisted by the interest of Lollius Avitus, a man of a consular family and his father's patronus, he was promoted to a command. He was sent to Syria at the head of a cohort, and served with distinction among the Parthians, under L. Verus, the colleague of Marcus Aurelius. He was afterwards sent to Britain, where he remained for some time. Subsequently he served in M浙江, Germany, and Dacia; but upon some suspicion of his fidelity, he was recalled by Marcus Aurelius. Having been
among the guests. Pertinax recalled those who had been exiled for treason under Commodus, and cleared from oblivion the memory of those who had been unjustly put to death. But his attempts to restore discipline in the army alienated the affections of the soldiers, who had been accustomed to licentiousness under the reign of Commodus. As he found the treasury empty, he sold the statues, the plate, and all the valuable objects amassed by Commodus, and even his concubines. By this means he collected money to pay the Praetorians, and to make the usual gifts to the people of Rome. He publicly declared that he would receive no legacies or inheritance from any one, and he took away several taxes and tolls which had been imposed by Commodus. Pertinax was cherished by the senate and the people; but the turbulent Praetorians, secretly encouraged by the traitor Latus, conspired against the new emperor. After offering the empire to several persons, they went to the palace, three hundred in number. The friends of Pertinax urged him to conceal himself till the storm had passed; but the emperor said that such conduct would be unworthy of his rank; and he appeared before the mutineers, and calmly reproved them with the guilt of their attempt. He was making an impression upon them, when one of the soldiers, a German by birth, threw his spear at him and wounded him in the breast. Pertinax then covered his face, and, praying the gods to avenge his murder, was finished by the other soldiers. Electius alone defended him as long as he could, and was killed with him. The soldiers cut off the head of Pertinax and carried it into their camp, and then put the empire to auction, offering it to the highest bidder. [Didius, Julianus.] Pertinax was sixty-seven years of age, and had reigned eighty-seven days. (Capitolinus, in Historia Augusta; Dion Cassius, b. 73.)

Coin of Pertinax.

PERTUSSIS. [HOOPING-COUGH.]